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STIFF AND PAINFUL SHOULDERS WITH LOSS OF POWER IN THE UPPER EXTREMITY FROM INJURIES OR INFLAMMATIONS OF THE SHOULDER-JOINT.*

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This hitherto neglected subject has been receiving considerable attention in recent years, particularly in this country. Taylor[1] in 1905 offered the theory that the essential lesion in these cases was a palsy, produced by overstretching of the brachial plexus. Brickner[2] recently offered an interesting contribution, quoting in it from one of his own editorials of seven years ago, in which he took exception to Taylor's view and made the following statement: "Much pain and prolonged or even permanent incomplete loss of function are so often the unfortunate results of injury to the shoulder by slight violence, their anatomical causes are so obscure and the treatment is so unsatisfactory, that any rational contribution to the subject is most welcome." In the following year Codman's first paper[3] appeared, in which he maintained that the essential lesion was a subacromial bursitis, and in 1908 he presented a second paper[4] in which he reported a series of cases tending to strengthen his view. Baer,[5] Painter,[6] and others published the results of their experience, which still further supported the bursitis theory. In 1911 I offered a contribution in which I took exception to this view and concluded that in these cases we were dealing merely with the sequelæ of sprains and dislocations of the shoulder, the essential lesion being a laceration of the axillary portion of the capsule. Codman soon returned to the discussion with a paper[7] answering my criticisms and further supporting the bursitis theory. Brickner's is one of the most recent contributions to the discussion. He takes a position somewhat between that of Codman and mine, with a decided leaning toward that of Codman. The latter says that my explanation is a "rational" one, and I have no hesitation in saying as much for his and that it is based upon well-supported anatomical and *x*-ray evidence. We thus have established a discussion that may or may not be interesting, but at least represents much work.

I am of the opinion that this discussion will tend toward a substantial agreement on the most important features. Codman, for instance, concludes that we both refer to the same class of cases, but differ as to whether a lesion of the inner side of the capsule of the joint or a lesion of the supraspinatus tendon and hence of the subacromial bursa lying over it is of primary importance. He also agrees that the capsule lesion, which I am supporting, accounts for a minority of

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[1] *Med. News*, lxxxvi, 1905, p. 1013.

[2] *Amer. Journ. of Surg.*, xxvi, 1912, p. 196.

[3] *Bost. Med. and Surg. Journ.*, 1906, p. 613.

[4] *Bost. Med. and Surg. Journ.*, 1908, beginning Oct. 22, p. 533.

[5] Baer: *Johns Hopkins Hosp. Bull.*, Nos. 195, 196, June-July, 1907.

[6] *Bost. Med. and Surg. Journ.*, Mar. 21, 1907.

[7] *Bost. Med. and Surg. Journ.*, 1911, p. 115.

the cases. On the other hand I realized at the time I wrote my first paper that the abnormal changes found in the bursa by Codman deserved more attention than I was then prepared to give them. I am now convinced that they are of more importance than I then thought, and that they must be taken into account in the final solution of the problem. I am also convinced that we were both approaching the solution of the same problem from different sides, and that each was inclined to be satisfied with his own conclusions until driven by the other to a deeper analysis of the problem.

The issue is exactly as Codman stated it —*i.e.*, as to the relative frequency and importance in these cases of a subacromial bursitis on the one hand and a capsule laceration on the other. In my opinion there is more involved in the settlement of this question than appears on the surface. The establishment of the capsule theory will, I believe, furnish the key to the solution of other obscure conditions than those usually looked upon as stiff and painful shoulders. In my opinion the mechanism and lesions produced by forced abduction at the shoulder will be found to be at the bottom of the difficulties associated with dislocations of the shoulder, recent, old unreduced, and recurrent, most of the traumatic brachial paralyses of adults and children, and many of the occupation palsies. I expect to offer in a later paper some reasons for believing that fractures and dislocations of the shoulder region other than those affecting the shoulder-joint are probably the result of the same mechanism. In an effort to include in a measure the work I have already done I will offer here the conclusions reached in my first paper, and will then discuss briefly those points in Codman's most recent paper which I think will most tend toward a solution of the problem, permitting those readers, who are sufficiently interested, to reach their own conclusions on the other points by a reading of the papers already published. The following are the conclusions from the paper which I have published:

"A periarthritis from tears of the axillary portion of the shoulder capsule, due to forced abduction, offers the best explanation of the stiff and painful shoulders, with loss of power in the arm, variously diagnosticated as fibrous ankylosis, neuritis, paralysis of the deltoid, traumatic arthritis, etc.

"The most characteristic feature is a scapulohumeral limitation of movement, sometimes slight, often marked, but never complete. The associated loss of power and atrophy are due in part to disuse, but probably in most part to the perineuritis, neuritis, and resulting adhesions and compression of some or all of the brachial nerves in the axilla, adjacent to the wounded joint.

"Subacromial or subdeltoid bursitis does not explain satisfactorily the symptomatology in these cases, nor is it accounted for by the etiology usually suggested. The audible and palpable tearing which accompanies the breaking up of the limited abduction and external rotation in chronic cases, by the leverage of the arm under an anesthetic, is produced, not by the tearing of fibrous adhesions in the bursa, but of the axillary portion of the capsule shortened by cicatricial contraction in its relaxed condition.

"This bursa is circumscribed to the upper surface of the greater tuberosity of the humerus and the adjacent small portions of the short rotators inserting into it. When the bursa is inflamed the diagnosis should be easily made by the acute tenderness localized to the upper surface of the humerus, directly in front of the acromion, when the arm is in the position of rest—that is, adduction and internal rotation, which it practically always occupies.

"The capsule lesion is typified by that which occurs in an anterior dislocation of the shoulder, the frequency of which is as great as that of all other dislocations of the body combined. Those cases of stiff and painful shoulder in which there is no history of dislocation are explained, in the first place, by the spontaneous reduction of many dislocations as the arm falls from its abducted position to the side of the body, so

that they are not recognized as such; and in the second place by the much greater frequency of milder but similar tears (sprains) from forced abduction, which are not sufficiently extensive to permit the occurrence of a dislocation.

"Sprains are rarely recognized in this joint, because they are peculiarly obscure as to their etiology and symptomatology. At the moment of the forced abduction the patient is excited and does not appreciate the relation between this movement and the pain it produces, the capsule being poorly supplied with nerves and the pain of the moment probably slight. The arm immediately drops to the side into the position of most complete relaxation of the torn portion of capsule, and is kept there afterward because of the pain produced by abduction and external rotation, which drag on the seat of injury. The lesion is deeply seated and localized with difficulty, and the disturbances which follow are misinterpreted.

"The most rational method of treatment is that which aims at increasing the length of the contracted tissues to the normal, favors the absorption of the inflammatory material, and increases the power of the weakened and atrophied muscles."

The first point which Codman takes up from my paper he discusses on page 115 of his paper, and is an important one. I had emphasized as the most characteristic and important condition in these cases the scapulohumeral limitation of movement. Codman had maintained that in the breaking up under an anesthetic of this stiffness the audible and palpable tearing was due to the tearing of adhesions in the bursa, and I argued that it was the tearing of the contracted capsule on the inner side of the joint. In six cases Codman had cut down on the bursa and had thoroughly broken up the adhesions by his fingers or scissors, which according to his theory, I held, should have permitted normal movement without further resistance, and I sought to show from his paper that it was the leverage of the arm, after the bursal adhesions had been removed, that accomplished the desired result. Codman answers this by calling attention to the statement in his first paper that the forcible manipulations may "tear the normal joint structures more easily than the dense adhesions in the bursa, and thus rupture the atrophied and stiffened supraspinatus or one of the other short rotators." This misses the particular point I had in mind because it refers to cases in which the bursal adhesions were not first broken down by operation. Even so I would maintain that the manipulations should first break what was limiting normal movement and should not tear the normal structures until after the limit of normal movement had been passed. Moreover, in my opinion, neither abduction nor external rotation should tear the supraspinatus until after an anterior dislocation had been produced. These movements within their normal limits relax the supraspinatus and do not put it under tension until after the humeral head has left the socket anteriorly and is dragging after it the capsule and short rotators attached to the greater tuberosity. Codman adds that in one case, after opening the bursa, he found the short rotators so stiffened that further external rotation ruptured the fibers of the subscapularis in plain sight. I believe that the bursitis theory will not explain this occurrence, and that the capsule theory will. Under this muscle was a torn capsule, now healed and cicatricially shortened because the arm had been kept in adduction and internal rotation. Consequently the subscapularis must be adherent to the contracted capsule and shortened also. The two will resist external rotation, and when this is forced they will give way, more surely the capsule, which is the seat of the lesion and is the most resistant. Codman has opened the bursa in many cases, but saw the subscapularis tear in only one. This means, in my opinion, that the capsule usually tears without tearing the muscle, or tears it only slightly.

On page 116 Codman argues that the distention from injections in my cadaver specimens increased the thickness of the bursa at the expense of its diameter, so that the bursa is really larger than my

illustrations showed. I would refer to Fig. 1 of my first paper, in which is shown on the left shoulder a bursa in which the distention was maintained, and on the right shoulder one from which the injected material had all escaped, relieving it of distention and thickness. The empty one was decidedly smaller in diameter than the distended one. I had maintained that the bursa was considerably smaller than as described by Codman and Küster, and that it was limited chiefly to the upper surface of the greater tuberosity of the humerus. I will not discuss this point now further than to say that the chief function of the bursa seems to be to facilitate the movement of the tuberosity under the acromion, the two bony surfaces being in direct contact except for the intervention of the thin-walled bursa.

It is important that Codman "emphatically agrees" that a patient in falling never strikes directly on the shoulder, but practically always jerks his arm into abduction to save himself. Codman, however, believes that it is the active abduction producing the jerk that does the damage, while I believe that it is the passive abduction, as after the hand strikes the ground in a fall on the hand.

Codman, pp. 117 and 118: I had taken exception to Codman's statement that the pressure of a misapplied bandage could cause a bursitis. He says that this was to the point, but that I misunderstood him as regarding a previously uninflamed bursa becoming inflamed by simple fixation without trauma. He says that in cases of bursitis which occur after breast operations and Colles's fractures, etc., he doubts if adhesions would take place unless trauma were exerted on the bursa during the operation or at the time of the injury. Both of these instances of stiff and painful shoulders interest me very much, and I would like to offer an explanation for them. The fall on the hand is responsible for most Colles's fractures and for the forced abduction at the shoulder which produces the dislocations and sprains there, and therefore the tears of the axillary portion of the capsule. It is easily conceivable that the same fall should produce both lesions in the same case, the capsule lesion being insufficient to permit a dislocation or a dislocation having occurred at the moment of the accident only to be spontaneously reduced as the arm fell from the abducted position. This would account for the stiff and painful shoulder in association with a Colles's fracture. In most breast operations the axilla is thoroughly dissected, so that the cicatricial contraction in the axilla would easily account for the stiff and painful shoulder. It would also account for the palsy of the limb so frequently following this operation, since in many the axillary nerves are extensively separated from each other by the dissection and therefore become considerably involved in the cicatricial tissue and their function interfered with. I have elsewhere gone into this phase of the subject more fully, and on this point Codman says: "Dr. Thomas makes a reasonable and interesting hypothesis as to the manner in which the tear of the capsule involves the nerves."

When I wrote my first paper I fully realized that the fourteen cases which I had seen was a small experience upon which to take issue with an authority of such rich experience as Codman, who evidently observed closely and described accurately what he saw. Yet from my small clinical and cadaver experience I was convinced that Codman was not getting to the bottom of the problem, and I concluded to publish my observations. I fully agree with him that we may both be simply riding our hobbies, and particularly when he says, "I sincerely hope that some reader of this discussion will help Dr. Thomas and me in clearing up this subject."

I cannot permit to pass without comment some of Codman's observations concerning the anatomy of the shoulder-joint, which probably represent the generally accepted views. In substance he says that the capsule is almost a negligible structure and the real joint is made up of the short rotators. It is a commonly accepted view that the capsule does not maintain contact between

the glenoid cavity and humeral head. I am convinced from observations on the cadaver that this view is not correct. If a specimen is made consisting of the scapula and humerus with the capsule intact and all other structures removed, the humeral head can, in certain positions, be pulled from the socket about three-fourths inch to an inch. If, however, the head is placed snugly in the socket and the scapula is held vertically, about in its normal position, with the humerus hanging by its own weight, the head will not fall away from the socket. Not only will the head not fall away from the socket, but it cannot be pulled away, directly outward or downward. The now tense upper part of the capsule will prevent any movement whatever in these directions (see Fig. 1). If, however, the inferior angle of the scapula is turned inward a little the head will fall over the anteroinferior margin of the glenoid cavity (see Fig. 2). If the humerus is carried into the fully abducted position, the axillary portion of the capsule will become tense and again the head will be held firmly in the socket, nor can it be dislocated without tearing the axillary portion of the capsule (see Fig. 3). The two bones can be separated farthest when the humerus is about midway between full abduction and adduction and is not rotated. If now the humerus is fully rotated internally or externally, the capsule again tightens up and forces the bones snugly together. In life, when the body bends forward slightly, I believe that the head would slip over the anterior edge of the glenoid, if the surrounding muscles and connective tissue did not come to its aid, but the upper part of the capsule is probably an important factor in resting the muscles when the arms are hanging at the side. For these reasons I would disagree with Codman when he says that he believes that the entire ligaments of the shoulder could be removed and yet the function of the joint remain practically perfect. I believe that the capsule has the same important function to perform here as in most joints of the body—*i.e.*, to maintain the bones forming the joint in normal contact. As in other joints the capsule more than any other structure prevents movement beyond the normal limit, and before that can be passed the capsule must give way on the opposite side of the joint. The only position in which all parts of the capsule are lax at the same time is in the midposition between all extremes, including rotation, and then the muscles and atmospheric pressure probably maintain the contact. I have convinced myself that if the entire capsule were absent in life, the humeral head sooner or later, after the exhaustion of the muscles, would drop a variable distance below the acromion, a flail joint would result, and a severe grade of palsy of the limb would follow.[1] In the absence of the capsule when the arm was carried into abduction, the head and tuberosities would pass under the acromion, the outer surface of the humerus near the surgical neck would strike against the edge of the acromion, when further abduction would pry the head out of the socket anteriorly (see Fig. 4) against any resistance that the short rotators or any of the

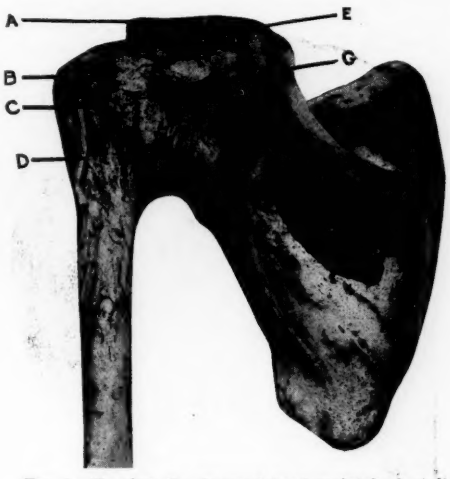

FIG. 1.—Showing the humeral head maintained at its normal level by the tense upper part of the capsule, the lower part being relaxed. The humerus is in external rotation so that the greater tuberosity presents externally, the lesser anteriorly, and the long head of the biceps between the two. When the humerus is held in internal rotation, as in the sling position, the greater tuberosity presents anteriorly, the lesser is under the coracoid process, and the anterior part of the capsule is further relaxed. A, acromion; B, greater tuberosity; C, lesser tuberosity; D, tendon of long head of biceps; E, coracoacromial ligament; G, coracoid process.

[1] *Journ. of Nerv. and Ment. Dis.*, xxxviii, April, 1911, p. 193.

other surrounding muscles could offer. In my opinion, the capsule is the great protector against dislocations, and must tear before the dislocation can take place, and tear extensively.

Codman says on page 118 that we frequently find complete normal mobility within a very short time after a dislocation of the shoulder. We have had several reports recently[2] tending to show that troublesome stiffness and pain almost always follow these dislocations. With the tear of the axillary portion of the capsule, which is probably always associated, and immobilization for some time in the sling position, which is the rule, it would be difficult to understand how it could be otherwise. But if the patient proceeds to use the arm freely immediately afterward, as many do, particularly athletes, the abduction prevents the usual cicatricial contraction of the capsule and surrounding structures in the axilla and favors the early absorption of the inflammatory tissue. By carrying the arm into full abduction, however, before the capsule tear has healed and restored the normal resistance to dislocation, the head may again be pried out of the socket, the plastic material at the site of the tear being stretched, so that with a repetition of the dislocations the capsule heals slowly in the axilla. The gap between the original margins of the tear in the dislocated position is bridged across by new cicatricial portion of capsule and a recurrent dislocation is established.

Fig. 2.—Same specimen as in Fig. 1, with inferior angle of scapula turned inward, showing how the humeral head drops away from the socket when it loses the support of the lower glenoid margin, thus indicating the importance of the muscles and atmospheric pressure in maintaining the normal contact of the bones in this position.

I am convinced that when the true explanation for these troublesome cases is discovered and is sufficiently tried out, it will from time to time furnish new evidence that will finally establish its correctness. As already stated, I have applied the capsule theory to other obscure traumatic conditions about the shoulder which have many points in common with these stiff and painful shoulders, and as far as I can see it has worked out satisfactorily every time. Brickner accuses me of ignoring the fact that many of these cases provide no history of trauma. In my first two papers, the second of which dealt with the paralytic aspect of the condition, I reported cases which were due to inflammation of the joint, not traumatic in origin. My experience was chiefly with the traumatic variety, as has been the experience of every other writer. In my judgment the symptoms of stiff and painful shoulder are nothing more nor less than those of an inflammation of the shoulder-joint, traumatic or infectious. The characteristic symptoms as I see them are the scapulohumeral limitation of movement, especially abduction and external rotation, because the limb has become fixed in adduction and internal rotation, pain in the shoulder region and referred to various regions down the arm, and, I would add, a weakness or palsy involving more or less the whole limb. The other symptoms of joint inflammation are there, including the rigidity, fever, etc., varying according to the degree of trauma or infection. As soon as the diagnosis is obvious, as in a well-developed arthritis, and the same tendency exists and seems to be increasing in connection with dislocations, we no longer speak of the case

[2]Schulz: *Beitr. z. Klin. Chir.*, 1908, lx, p. 333. Schmidt: *Deut. Zschr. f. Chir.*, 1911, cix, p. 20. Imbert and Dugas: *Rev. d. Chir.*, 1911, xliii, p. 187. Ashhurst.

as one of stiff and painful shoulder. We reserve this diagnosis for the obscure cases. The reason for the failure to accuse the joint is probably that it is difficult to establish the presence of a mild or moderate inflammation in this joint, which is deep and rarely reveals swelling and fluctuation. For obvious reasons any inflammation will tend to fix the joint in the position in which it has been resting during the period of inflammation, and the longer it stays there the more firmly will it become fixed. The synovial membrane and capsule on the inner side will, from stiffening and adhesions in its relaxed condition, resist movement later —*i.e.*, abduction and external rotation, which drag upon this portion of the capsule.

Brickner has long been studying these cases, and while he tends to favor Codman's view, he "is inclined to believe that Codman overestimates the frequency of the occurrence of subacromial bursitis, that his classification is not sufficiently complete, and that perhaps his clinical descriptions and mechanical explanations may need some modification." He had an interesting but rare experience. In one of these cases of stiff and painful shoulders of traumatic but obscure origin he carried the arm in the early stages to the horizontal and suddenly found that he had a subcoracoid dislocation to deal with. He then concluded that in this case the cause of the stiffness and pain was a laceration of the capsule, and he now thinks "that perhaps many of these cases of stiff and painful shoulder have their origin in *an unrecognized, spontaneously reduced dislocation.*" Assuming that he admits the capsule tear in all recognized dislocations, to agree with me entirely it remains only for him to admit that the remaining cases are due to the same cause which produced the dislocations, but which was not forceful enough to produce a laceration of the capsule sufficiently extensive to permit a dislocation, but did produce a tear of milder degree—*i.e.*, a sprain. He rejects my conclusions on the grounds that I take no account of the many undoubted cases of subacromial bursitis and of fracture of the greater tuberosity, and that I ignore the fact that many of these cases provide either no history of trauma (as already stated I did not ignore this) or none of such violence as would be necessary to tear the shoulder capsule. I do not know how to determine the degree of violence necessary to tear the capsule in any given case. I saw a patient who had a stiff and painful shoulder of about eleven weeks' duration, in whom the *x*-ray showed an anterior dislocation of the shoulder, and yet the patient could not recall having sustained any injury to the shoulder. I assume that the presence of the dislocation indicated an extensive laceration of the axillary portion of the capsule, yet there was nothing in the history to show how much violence was applied. From a large number of cases Brickner selected a few which emphasized features of a subacromial bursitis. Only one of his cases was operated on, and that showed sterile pus in the bursa and a calcareous deposit on its floor.

FIG. 3.—Same specimen as in Figs. 1 and 2, showing the normal limit of abduction without movement of the scapula. Lower part of capsule now tense and maintains close contact of the two bones. If the scapula were firmly fixed, further abduction would tear the axillary portion of the capsule, which is anteroinferior because of the inclination of the scapula in the sagittal plane. After an extensive capsule tear, the edge of the acromion would become a fulcrum and the humeral head would be pried out of the socket.

It is evident that the capsule theory finds its most serious obstacle in the changes found in the bursa at operation and by the *x*-ray. I realized early that this bursa must be traumatized in a dislocation of the shoulder, since the floor must follow the tuberosity to its dislocated position, because adherent to it, while the roof must remain behind in its normal position because ad-

herent to the under surface of the acromion; but I thought that the disturbance created would disappear later, after the reduction. One of the most interesting and obscure features of subacromial bursitis is the so-called calcification, which was at first said to be in the bursa, but which Codman found to be under the floor of the bursa and in the supraspinatus tendon. I regard this as a most valuable observation, and I believe that it goes far toward establishing these calcifications as normal bone tear fractures of the greater tuberosity. Normally there

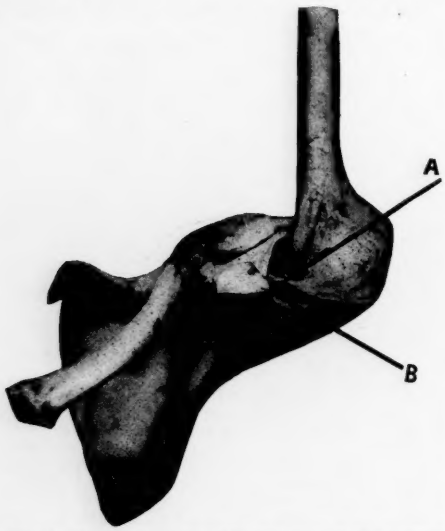

FIG. 4.—Showing how the abducting force is transmitted to the upper part of the capsule (A) after tearing it extensively in the axilla. We have here also an explanation of the mechanism of the tearing away of the long tendon of the biceps (B) from the upper margin of the glenoid, which is not an infrequent occurrence.

is no room between the tuberosity and the acromion for an abnormal calcification because they are directly in contact with each other, only the thin walls of the bursa intervening. The floor of the bursa is adherent to the tuberosity and the supraspinatus tendon inserts into it, and any calcification found loose under the bursa and adherent to the supraspinatus tendon must be, in my opinion, a part of the tuberosity. The usual cause of the bursitis, according to Codman, is a tear of this tendon. The same force which tore the tendon in one case pulled away its bony attachment in another. The peculiar grumous material found under the bursa in some cases is probably the result of the inflammatory process set up by the fracture or torn tendon. The bone itself may soften from the irritation of friction as it does in fractures of the neck of the femur, where the whole neck may be worn away by the wearing effect of one fragment on the other. I have not read of calcification occurring in other bursæ—why should it be so peculiar to and so common in this bursa? Brickner finds it practically impossible to distinguish between bursitis with calcification and fractures of the greater tuberosity, by the symptoms or the skiagraph. He believes, however, that the diagnosis of the fracture is fairly easy when there is a clear history of direct violence producing the fracture. I would place no reliance on such a history. As already stated, Codman agrees with me that in falling a person practically never strikes first on his shoulder. We have not yet determined the mechanism of this fracture, although Kocher, twenty-three years ago, called them tear fractures, in connection with anterior dislocations of the shoulder. The *x*-ray has since shown them to be commonly associated with these dislocations, and Kocher found this fracture in seven of his eight cases in which he operated for old unreduced dislocations of this joint. I believe that I have been the first to offer a mechanism for this fracture, and I wish here to make a further effort to establish it, because I believe that it has an important bearing on this question of subacromial bursitis.

In my first paper I gave reasons for regarding abduction as the dangerous movement of the shoulder. Probably the most frequent seat of forced movement in a joint is at the ankle, where the dangerous movement is the lateral turn of the foot, inward or outward. It is responsible for those very common injuries, the sprains, sprain fractures, and Pott's fractures, which are merely modified sprain fractures, and probably several other injuries, undoubtedly for the lateral subastragaloid dislocations. We frequently have lateral dislocations of the

ankle-joint from this simple mechanism, but they are classified with the fractures because the associated fractures represent the most serious condition. In my opinion abduction is to the shoulder what the lateral turn of the foot is to the ankle. In both it is the capsule that first takes the strain and gives way or tears off its bony attachment. External rotation is important at the shoulder but distinctly secondary to abduction. When abduction carries the movement beyond the normal limit the joint capsule gives way on the axillary side of the joint, sometimes taking with it a fragment of the glenoid margin, which then becomes a tear fracture. If the force continues the greater tuberosity glides under the acromion, or rather further under, and the humerus just below comes in contact with the edge of the acromion, the continued abduction forming here a sliding fulcrum and at the same time prying the head out of the socket below and anteriorly, when the humerus will be in contact with the scapula at about the surgical neck (see Fig. 4). It is at this stage that the upper and posterior part of the capsule and the overlying and adherent external rotators take the strain because of their attachment to the greater tuberosity. As the head is being pried out of the socket, these are resisting its progress. If the force spends itself at or before this stage of the mechanism, the upper portion of the capsule and the overlying rotators remain intact; if not, they give way also, the capsule probably first, the overlying tendons frequently giving way with the capsule. The supraspinatus tendon probably takes the greatest strain because of its position, but the infraspinatus and teres minor probably also give way frequently. I have a dissected specimen of such a condition in the cadaver in which the detached margins contain small fragments of the greater and lesser tuberosities (see Fig. 5).

This is an old specimen in which the fracture of the greater tuberosity attracted no particular attention at the time it was produced, and the circumstances of its production are forgotten. Recently I obtained in each shoulder of a cadaver in association with an anterior dislocation, produced simply by forced abduction, a fracture of the greater tuberosity (see Fig. 6). It is an interesting fact that in the old specimen and in both of the recent ones the capsule tore from its humeral attachment. In another cadaver the same kind of capsule tear occurred in both shoulders. The tearing begins, of course, on the axillary side, and is prone to tear away from the humerus in almost or its whole circumference before the dislocation is accomplished. In one

FIG. 5.—Upper portion of capsule and overlying rotator tendons torn from the greater tuberosity, a small portion of the latter being detached also. A, thin shell of bone detached from B or greater tuberosity.

shoulder of this last specimen a very small spicule of the greater tuberosity was detached, but on the other side no detachment of bone could be detected. Another interesting fact is that when the humeral head is in the dislocated position it is intracoracoid rather than subcoracoid. In the former the head is displaced further from the socket than in the latter—*i.e.*, the portion of the capsule and the overlying rotator tendons attached to the greater tuberosity are under greater tension and, I believe, are compelled to tear before the head can occupy this, the intracoracoid position. The

important point in the present discussion is that in the production of an anterior dislocation by the usual mechanism, without the application of direct violence to the shoulder, the typical fracture of the greater tuberosity should occur. The subacromial bursa lies directly over the tuberosity, and, therefore, the detachment of the capsule and rotator tendons in each instance, which fully explains the occurrence of the inflammation in the bursa. It explains the ruptures of the supraspinatus tendon found by Codman as well as the "calcifications" under the floor of the bursa and in the supraspinatus tendon. When the head is reduced the torn margins of the capsule apply themselves about to their normal position close to the bone surface from which

FIG. 6.—Tear fractures of greater tuberosity obtained in a cadaver with dislocations of the shoulder produced by forced abduction. Dislocation reduced on right side, unreduced on left side. A, A, detached fragments of right and left humeri; B, B, right and left acromion processes; C, C, right and left coracoid processes.

they were torn, so that after the healing has taken place it will require a careful search to find the cicatricial evidence of the original tearing. I could scarcely have obtained better experimental confirmation of the position which I am trying to establish. Ross[1] has already reported a similar fracture of the greater tuberosity produced by forced abduction.

Thus we see that we may have a tearing loose of the capsule only in this region, of the capsule with the supraspinatus alone or with the other external rotators. The tendons of the three external rotators are all fused one with the other at their attachments to the greater tuberosity. The tendons may give way at or near their bony attachments and may take away a few small spicules of bone, a thin fragment or one of considerable size. The kind of material which would be found at operation on exposing the bursa and therefore the greater tuberosity would vary a good deal, according to what kind of a tearing had taken place at the time of the dislocation. It is easily conceivable that the dislocated head often jumps back into the socket as the arm falls to the side immediately after the force has spent itself. Even at the ankle we cannot always rely on the statement of the patient in determining the nature or degree of the violence applied, but if the foot is found afterward to be displaced markedly to one side it is a fair inference that more force was applied than in a case in which the foot was in the normal position after the accident. The foot is left in bad position because there is no force to pull it back into its normal position. That is not true of the shoulder. No matter what the degree of abducting force applied or the damage done, the limb will not remain in the position into which it was forced because gravity will compel it to fall immediately afterward, except in those rare cases of *luxatio erecta* and *horizontalis,* in which in some way the humeral head becomes caught in the axillary tissues and prevents the arm from falling to the side. The mechanism which I have outlined for the shoulder injuries is as simple and rational as that of the lateral turn of the foot for injuries of the ankle. The obvious inference to be taken from it is that where we find a fracture of the greater tuberosity the humeral head was out of the socket at the moment the fracture occurred, and just preceding the dislocation an extensive laceration of the axillary portion of the capsule had taken place. There is little question concerning the frequency of these fractures in the recognized dislocations of the shoulder, but it is their occurrence in cases without a history of dislocation that has prevented us from determining their mechanism. The hypothesis that many are spontaneously reduced as the arm falls to the side of the body removes this difficulty. Of course we will have a subacromial bursitis in the cases in which there is a fracture

[1] *Annals of Surgery,* 1912, lvi, 599.

of the greater tuberosity, or the capsule and tendon have torn from the tuberosity because the floor of the bursa lies directly on and is adherent to the tuberosity and tendon, but we should not overlook the serious capsule lesion on the axillary side of the joint. In many cases the fragment or fragments will reunite (I have found this several times at operation) and the bursal disturbances will disappear. But there will probably be many cases in which the fragment will not reunite and many others in which with union of a torn tendon in the floor of the bursa, exuberant growth of the reparative tissue will cause prolonged or permanent pain and tenderness, justifying the small operation of exposing the bursa and removing the cause of the disturbance.

Codman in his last paper refers incidentally to two cases of long standing, irreducible dislocations of the shoulder, upon which he operated and found the supraspinatus and infraspinatus tendons, with facets of bone pulled out of the tuberosity, lying in the glenoid and thus preventing reposition. Suppose that in these two cases the dislocation had been spontaneously reduced as the arm fell to the side of the body immediately after the dislocating force had spent itself. The facets of bone would have fallen about into their normal positions and a stiff and painful shoulder would have resulted in both cases, and would, I believe, have been due chiefly to the extensive tear of the axillary portion of the capsule which occurs in all anterior dislocations. If the fragments did not reunite, and some time later the bursa were to be exposed, there would be found a calcification under the floor of the bursa and in the supraspinatus tendon. It would have been practically impossible to differentiate the tendon of the infraspinatus, as it fuses with that of the supraspinatus, and both are covered almost completely by the acromion process. We would then have two typical cases of subacromial bursitis with calcifications as they have been described by Codman. The removal of the abnormal contents of the bursal region would in all probability remove the pain and tenderness in this region, but it would not remove the chief cause of the limitation of movement, which would be at the site of the capsule tear in the axilla.

I have regarded the loss of power in many of these cases as deserving consideration. Codman refers to it very briefly, Brickner did not observe it, while Taylor looked upon it as the essential lesion and ascribed it to an overstretching of the brachial plexus above the clavicle. An important point in Taylor's paper, although it is implied only, is that the stiff and painful shoulders of some writers are the traumatic brachial paralyses of others. The supporters of the bursitis theory practically ignore the paralysis, while Taylor ignored the fixation of the shoulder. I have convinced myself that both are due to the cicatricial changes at the site of the capsule tear, the inclusion of the nerves to the arm in the cicatricial tissue and adhesions being quite sufficient in many cases to produce a

FIG. 7.—Skiagraph of right humerus from specimen illustrated in Fig. 6. It shows how a fracture of the greater tuberosity may fail to be recognized in the *x*-ray. The only evidence of the fracture is in the decreased density of the bone in the region of the fracture. The humerus was placed in the position most favorable for exposing the line of fracture to the *x*-rays.

severe form of paralysis. Nothing proves this better than to see, upon the simple restoration of the normal motion to the shoulder-joint, the paralysis melt away, and not very slowly.

F. Lange[1] has recently contributed a paper in which he discusses a group of cases that are at least very similar to these stiff and painful shoulders. He emphasizes in the clinical picture the importance of what he calls the "distortion" of the joint from the effusion in it. By a turning of the scapula, he says, there is concealed an abduction of about 30 or 40 degrees, an anterior elevation or flexion of the arm, and there is internal rotation of the arm. This is a deformity which I have not recognized in my cases, but it may have been present. I believe, however, that it will not be present in the later stages in which I have seen most of my cases and when the effusion has been absorbed, although, according to Lange, it seems to be present in all cases. (Since writing the above, I have examined a few cases and did not find it.) His chief object seems to be to establish a method of diagnosis of mild or moderate inflammation of the shoulder-joint, which is most frequently traumatic. Apparently his object in seeking a method of diagnosis of the joint affection was to differentiate it from injuries to structures near the joint, particularly that resulting in a subacromial bursitis.

He concludes that the differential diagnosis between a joint inflammation and a subacromial bursitis is easily made. Of the latter, he says that the anterior and posterior pendulum movements and the rotation movements are free, while abduction is possible only to the horizontal. Of the distortion of the joint due to inflammation he says: "If a considerable restriction of elevation of the arm posteriorly and of external rotation is established, while all the other movements are entirely free, then the diagnosis of distortion is established." From these findings it will be seen that the differential diagnosis between the two conditions should be made by the difference in the movements which are limited. These conclusions will be very valuable if they prove to be correct. Evidently Lange's statements concerning subacromial bursitis are based not upon his personal experience but upon the work of Küster and Küster's assistant, Colley. Codman, who has done the most and best work on subacromial bursitis, says that he does not agree with Küster on the freedom of the rotation movements. Since it is generally agreed that in subacromial bursitis the restriction of movement is due to the adhesions between the bursal surfaces and therefore to the fixation between the upper end of the humerus and the under surface of the acromion—*i.e.*, between the two bones forming the shoulder-joint—it would appear *a priori* that every movement between the two bones, *i.e.*, every movement of the shoulder-joint, should be limited in varying degree according to the length of the adhesions between the roof and floor of the bursa. Lange accepts Küster's conclusions without question and finds it easy to differentiate between the two conditions. I cannot accept Küster's view, but prefer to believe with Codman that we are all studying essentially the same condition, the main difference being one of interpretation. In my opinion, Lange is merely viewing them from the standpoint of a joint affection, as I have done. He studied, particularly, the traumatic variety, as have the other writers, because they are by far the most frequent. He believes that the traumatic variety is due to a laceration of the anterior portion of the capsule, but he does not explain why the anterior rather than any other portion of the capsule should be, by preference, the seat of the lesion. I have explained it, but have insisted that it is the anteroinferior rather than only the anterior portion which is torn. The fact that Lange considers the laceration an anterior one may explain why in his opinion only the elevation of the arm posteriorly or the posterior pendulum movement and external rotation are the movements restricted in the joint condition.

When the movements of a joint are so

[1] *Münch. med. Wochenschr*, lix, 1912, No. 23.

free and complex as in the shoulder it will, of necessity, be difficult to describe the limitations of those movements. Because we have here a ball and socket joint, the arm may be moved freely in any direction, and the combination of any other movement with rotation provides for an indefinite variety of movements in this joint. But I believe that this phase of the subject can be much simplified. When the joint is inflamed the arm seeks naturally the position of rest—*i.e.*, adduction and internal rotation as in the sling position. As a result the capsule loses all relaxation above and to a large extent posteriorly, and becomes most relaxed below and anteriorly, where it becomes folded on itself or wrinkled (see Fig. 1). The process of inflammation will involve the synovial membrane and capsule, rendering it more rigid than normal in all parts. The limitation of movement will be due chiefly to the failure of the folded axillary portion to unfold itself to its normal length because of its rigidity and adhesions. Every movement, therefore, away from the position in which it has become fixed will be limited according to the variation in shortening of the capsule due to the degree of movement permitted during the stage of inflammation. The grade of inflammation will also influence the degree of fixation. If the relaxed portion is the seat of a more or less extensive laceration, as in the traumatic cases, the resulting cicatricial tissue will cause a more unyielding fixation than would result from a moderate non-suppurative inflammation. It is easily seen that not only will posterior elevation and external rotation be restricted, as Lange maintains, but any movement tending to take the arm from the position in which it has become fixed. Because the patient can swing the arm forward and backward within a considerable range, it is not correct to say that the pendulum movements are entirely free. If the joint were absolutely ankylosed, movement of the scapula on the thorax would be free enough to still permit a fair range of the pendulum movements and the anterior pendulum movement would be freer than the posterior. The anterior pendulum movement is not normal until the patient by it can place the arm straight up alongside of the head. In my opinion, when the arm becomes fixed in the sling position, either by adhesions in the subacromial bursa or by a contraction of the axillary portion of the capsule, there will be a restriction of every movement from that position. Moreover, the normal limit of anterior elevation or the anterior pendulum movement is the same as the normal limit of abduction—*i.e.*, when either of these movements is carried to the extreme the arm will be straight up in the air alongside of the head. Again, when in any of these stiff and painful shoulders the patient can place his arm in this position, I believe that every other movement of the joint will be practically normal, because I think that by that time every contracted portion of the capsule will have been lengthened to the normal. It does not seem to me that Lange has established a method of differential diagnosis between subacromial bursitis and a contraction of the axillary portion of the capsule resulting from inflammation of the shoulder-joint. Codman's position is the more tenable, that we are all studying the same group of cases. That Lange ascribes these cases to an inflammation of the shoulder-joint, and particularly the traumatic cases to a laceration of the anterior portion of the capsule, brings a powerful support to the capsule theory. That in a second paper,[1] appearing two weeks after the first, in the same journal, he should apply the capsule theory to the explanation of the brachial birth palsies, which I had already done, is still more gratifying. That he should, on the basis of the capsule theory, reach the conclusion that the day for the "let-alone treatment" of these obstetrical palsies has passed by, is one of the most valuable results of Lange's work.

In the treatment of these stiff and painful shoulders, as of all stiff and painful joints after the acute effects of the trauma have subsided, the chief indication is to restore

[1] *Münch. med. Wochenschr.*, lix, 1912, No. 25.

normal motion. The patient can accomplish this result sometimes unaided, and the more rapidly the more he forces the limited movements. But with the proper appreciation of the underlying cause, a cure can be brought about much more quickly and with far less pain than when it is left to the unaided efforts of the patient, who often gives up all hope of recovery and does practically nothing to accomplish it. The condition at the shoulder-joint presents peculiar difficulties. Since the joint becomes fixed in complete adduction and almost complete internal rotation, the limb must gradually be made to pass through the wide range of movement from adduction to full abduction by more or less painful exercises, while considerable difficulty will be experienced in providing full external rotation. In the great majority of cases, when full motion is acquired, the patient will cease to complain of pain or troublesome weakness.

In the early stages rest is desirable until the acute symptoms have subsided, but the patient should not be prevented from using as much motion as he can tolerate. If he keeps it absolutely fixed he will have less pain, but much more trouble later in overcoming the resulting greater cicatricial contraction. As soon as the acute symptoms have been allayed, efforts should be encouraged to force the resisted movements. I have the patient provide a horizontal bar to which he can reach with the hand on the affected side, and from which he can frequently apply traction on the contracted tissues in the axilla. A hanging rope is a useful means of accomplishing the same purpose, or the patient can creep up the wall or other vertical surface with his hand, marking from time to time any progress made. In the later stages the use of Indian clubs is very useful. Massage and passive motion at the hands of a masseur are always useful, particularly when the patient finds it difficult to force the movements. Codman has suggested an exercise which ought to become very serviceable, the bending forward of the patient in the effort to touch his toes. In this position the arm is carried by gravity into a fair degree of abduction and ought to be easier for the patient than raising the arm against gravity, which calls for contraction of the muscles and tends to produce spasm and more pain.

In the chronic, stubborn cases, however, and in patients with severe limitation of movement at the end of five or six weeks, who are impatient with the slow progress and who have much pain, forcible manipulations under a general anesthetic, nitrous oxide being often sufficient, are of decided advantage. Codman formerly kept the arm in abduction after operation, but he found this position so irksome both to the patient and himself that he has abandoned it. Although it did shorten the convalescence, it did not materially relieve the pain. I have had the same difficulty in maintaining abduction on a splint, but have had much better results since I began to encase the splint in a light plaster cast and to keep the patient in bed while his arm was in this position. It is the motion in the shoulder-joint, which I found unavoidable with the ordinary use of a splint, and particularly when the patient tried to walk around with the arm in this position, that gave rise to most of the disturbance. If the patients stay in bed with such a cast applied they soon have no pain. The reason for this method of treatment, as I understand the condition, is that the effect of the manipulations is to tear the contracted capsule, and if the arm is kept at the side for two or three weeks afterward the shoulder will be as stiff as ever, because the margins of the tear will have reunited in their contracted condition, the only advantage gained being that the new cicatricial tissue is less resistant than that which existed before the manipulations. I find that if the arm can be kept in full abduction for two or three weeks, the filling in of the gap between the separated margins of the newly torn capsule will have advanced to such a stage that the patient will be able to maintain the axillary tissues at their normal length afterward without great difficulty. If the arm is brought to the side immediately after the manipulations, it will

take from two to six months to get a return of normal motion. By fixing the arm in full abduction afterward I can get practically full motion in six weeks, and I believe with much less pain. In the first case I ever treated with forcible manipulations under an anesthetic, the patient had a severe type of palsy and insisted on going home in a few days after the manipulations, so that I brought the arm to the side of the body after twenty-four hours. He agreed to force the arm into full abduction twice daily. It was heroic treatment, that could have been obviated by fixation in full abduction for two weeks, but he carried it out, and in eight weeks had full motion and enough power to return to work as a coal miner, although he had not been able to do so since the accident more than a year before. He had given up all hope of ever having a useful arm again. I have had about a half-dozen similar cases, and the result is always the same, the disappearance of the palsy with the restoration of the normal motion to the shoulder.

I have been disposed to be contented with efforts to restore the normal motion and to consider that the various painful points would disappear with the return of motion or soon afterward. In ignoring the tenderness at the site of the subacromial bursa, which I have found in some cases, I believe that at times I have not done justice to my patients. In one case in which the patient complained of much pain on motion of the shoulder months after the causal injury, when there was only slight limitation of motion but acute tenderness over the bursa and a slight grating on movement of the humerus, I opened the bursa and found a number of small exuberant masses in its floor but no adhesions. I removed the masses with scissors and curette. The patient was soon relieved of all pain and had full use of the arm. I believe that I have overlooked several such cases in the past. I had under observation a few months ago a similar case, but with *x*-ray evidence of a small fracture of the tuberosity. I believe that these fractures frequently fail to reunite, and although I could determine a slight grating at one time, this had entirely disappeared the last time I saw him and the tenderness had also almost disappeared. If the pain and the grating had persisted, I would have advised the small operation of exposing the bursa and removing any small loose fragment and anything else that appeared to be a cause of the disturbance.

Moren,[1] who believes that the "strain from abduction" is the most common cause of stiff and painful shoulders, reports a number of cases of "baseball" or "glass" arm, and believes that the cause is in the shoulder. One of my patients told me that he had had one of these "pitcher's arms," but that his trouble was in his elbow, and that he knew of another player who had his trouble in his elbow also. I have been convinced for some time, however, that in most cases the cause is in the shoulder. I have already explained it on the basis of a torn capsule, the tearing occurring when the arm is in full abduction and the capsule tense and the adductors of the shoulder make a powerful contraction, to give the ball its speed, thus bringing the humeral head forcibly against this tense portion of the capsule. The shoulder has been dislocated in this way.

The condition appears to be very common among baseball players, especially pitchers. My impression is that the demands of modern baseball pitching are too great for the normal shoulder, so that many of the professional players suffer more or less constantly. I examined a major league pitcher in June, 1911, and found a painful shoulder, but not a stiff one. The history of this patient and his comments on other players seemed to show that the modern pitcher does not permit his shoulder to become stiff. The lesion is probably the same as in the ordinary stiff and painful shoulder, but the victim keeps working out the stiffness by "warming up" practice, when he is not able to go into a game. Many players continue to play in regular games, but then cannot be at their best, and often the player

[1] *Kentucky Medical Journal*, ix, Nov. 15, 1912, p. 881.

is forced out of a remunerative position because of the trouble in his shoulder. The pitcher whom I examined first noticed in a game played in July, 1910, that his arm became sore. He did not pitch again until the fall, when his arm became sore again. In April he again pitched, but no trouble followed. His next game was on May 1, and the soreness returned. Two weeks later another game and soreness, which lasted about a week. Usually it was over in a few days. Then a week apart he played two more games, and since the last he has had more trouble than after the others. The impression I obtained from this case was that the capsule lesion was a small one to begin with, and that after his first long rest with enough practice to keep up the motion there always remained a little shortening, which a heavy game would overcome by tearing and thus start trouble again. I fancy that if after all pain and tenderness had disappeared he had gradually worked the stiffness out he would have stretched the cicatricial tissue to the normal and a real cure would be obtained. But even then he would be exposed to the danger of another tear as in the first instance. The real problem is probably one of prevention rather than of cure.

CONCLUSIONS.

The discussion which has arisen concerning these so-called stiff and painful shoulders is tending toward an agreement on the essential features. The statements of F. Lange to the effect that we are dealing with two separate conditions, easily differentiated from each other, are not supported by the facts. Codman's view is probably the correct one—*i.e.*, that the cases ascribed to subacromial bursitis are in most instances, at least, the same in type as those ascribed to a laceration of the anterior portion of the capsule of the shoulder-joint. The difference in opinion is the result of interpretation of the cause of the symptoms. The operative and post-mortem observations of Codman laid the foundation for the solution of the problem, since they first located a definite and positive lesion, which has since been found by others.

My contention is that the cause of the trouble in the bursa is an extension of the capsule tear from the axilla to the outer side of the joint, the overlying tendons in the region of the greater tuberosity giving way also and frequently taking with them a portion of the tuberosity. The chief cause of the stiffness and pain, however, is the contraction on the axillary side of the joint. This accounts for the tear of the supraspinatus tendon, to which Codman ascribes the bursitis. Brickner's report of a case of spontaneous reduction of a dislocation of the shoulder, unsuspected by the patient, is a valuable contribution. The difficulty which he experienced in making the diagnosis between fractures of the greater tuberosity and "calcifications" of the subacromial bursa is a valuable aid in showing that the "calcifications" are fractures of the greater tuberosity.

Taylor's view that the essential lesion is a palsy from overstretching of the brachial plexus, according to my knowledge, is the first recorded suggestion that these stiff and painful shoulders belong in the group frequently ascribed to injuries to the brachial plexus or its roots. I have seen very severe brachial paralyses, traumatic in origin and of weeks' and months' duration, melt away from the use of the arms after the restoration of the normal motion in the shoulder-joint. This proves that the cause of the paralysis was an injury to the joint and not an injury to the nerves.

Since I offered the capsule theory in a paper published nearly fifteen months before Lange's papers appeared, and since he does not show that any one else had previously suggested it, I must claim priority for it. It is particularly gratifying that he should extend its application to the explanation of the obstetrical palsies of the upper extremity. The fact that it has led him to say that the day for the "let-alone treatment" for these obstetrical palsies has passed by should encourage others to test its efficiency.

A POSTGRADUATE SURGICAL CLINIC AT THE UNIVERSITY HOSPITAL.

BY EDWARD MARTIN, M.D.,
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Since this morning's discussion is before a body of men all of whom are engaged in the active practice of surgery, many to the exclusion of all else, some as a part of a general practice, it seems desirable to omit a consideration of surgical technique in detail, since this can be found admirably set forth both in current literature and in standard works, and to concentrate attention upon the methods as practiced in this clinic, which have for their end the well-being and comfort of the patient before, during, and after operation, a foreknowledge of the vital resistance to surgical trauma and the anesthetic of choice, and a careful avoidance of all factors, both psychic and physical, which may directly or indirectly interfere with the tranquil approach to an operation, its sustained tolerance, and a smooth and comfortable convalescence.

The preparation of a patient for operation is both psychic and physical. The psychic preparation implies on the part of the patient a fixed belief in the need for the operation, its complete safety, and a comparatively painless and prompt and complete convalescence. Such a belief is convincingly impressed upon patients, friends, and relatives only when it has a real existence in the minds of the surgeon, assistants, and nurses, and is therefore consciously and subconsciously expressed in every word and act. The psychic preparation is founded in a cheerful and sincere optimism, which when most skilfully impressed converts a dreaded ordeal into an exciting incident.

The general physical preparation implies that the cardiovascular and respiratory systems should be in a reasonable condition of efficiency, that the eliminative organs should be acting freely, and that the gastrointestinal tract should be, if not clear, at least freed, in so far as this is practicable, of waste material.

In all cases it is advisable when time is offered to produce free diuresis by ingestion of water always short of the quantity which interferes with the desire for food and its digestion. Postoperative tympany and intestinal toxemia are favored by full intestines, since the intestinal torpor or stasis which always follows anesthesia and surgical procedures offers favoring conditions for fermentation or putrefaction. Empty guts are best secured, when this is practicable, by reducing the diet for three days to one-half or one-third the usual quantity, leaving to the patient the selection of the foods which experience has taught him are most digestible. Where there is a natural and sufficient daily movement laxatives are not indicated. When this is not the case the laxative is given which the individual's experience has taught is to him least irritating and most efficient.

When no opportunity is given for several days' preparation it is not the custom here to give an active purge except to the gross feeders of robust physique. The immediate effect of such a purge is locally irritating and often systematically toxic. Neither locally nor generally is the patient thus best prepared for operation. Rather there is administered the laxative of the patient's choice, and this is followed by a simple enema.

As a rough test of efficiency of the cardiovascular system the heart and at times the blood-pressure are examined during rest and after active exercise. Where a dangerous degree of insufficiency is suspected ratio blood-pressure may be taken, as described by Dr. Landon.

As to the functional activity of the kidneys, it is well recognized that the ordinary urinary examination for albumin and casts, even when supplemented by a total 24-hours' quantity and urea estimation, is by no means conclusive. In this clinic it is customary in major cases to make the phenolsulphonephthalein test. It is simple, safe, painless, and thus far has proven entirely applicable. It is described by Dr. Laws.

The preparation of the operative field, where time offers, is by a preliminary bath the night before operation, followed by shaving and green soap, alcohol and bichloride washing, and the application of a dry sterile gauze dressing. Immediately before operation the part is painted with 5-per-cent tincture of iodine. When no time is offered for such preparation the painting with iodine is employed without preliminary preparation, using the pure tincture, and in dirty wounds painting every recess. This has given better results than those obtained by other and more complicated methods.

In the preparation for anesthesia, morphine and atropine are used for excessively nervous patients and for drunkards. As a rule multiplicity of drugs is avoided. Immediately before operation the nose and throat of the patient are sprayed with a 4-per-cent eucaine lactate solution with 1:10,000 adrenalin. This is theoretically serviceable as a means of lessening the danger of cardiac inhibition, and is directly useful since it greatly lessens reflex coughing, the sense of suffocation, and for a time at least the secretion of mucus.

Habitually nitrous oxygen is used for quick operations; nitrous oxide, followed by ether, by the open method for prolonged ones. Spinal anesthesia presents such strong claims in certain classes of cases that it will probably form a part of our routine procedure. The choice and the method of anesthesia are considered at length by Dr. Laws.

The patient's comfort and well-being whilst on the operating table very properly receive due consideration. A position which avoids nerve pressure; if the decubitus be dorsal, a pillow beneath the small of the back; covering the body, except the seat of operation, with blankets rather than impervious material—these are the methods of avoiding needless trauma and preserving body heat. There seems reason to believe that the proper support of the back lessens the incidence of postoperative backache, though in the experience of this hospital the comparative rarity of this complication seems attributable to the greater care with which the anesthetic is now habitually given. The avoidance of a mackintosh or other form of rubber covering seems desirable, since its use prevents that free skin transpiration which is apparently essential to well-being. It is undoubtedly true of many persons in comparatively perfect health that they are unable to wear a raincoat for more than an hour without a general feeling of malaise.

The after-treatment is conducted on the principle of the least done the better. Dr. Carnett gives a more detailed description of this. The patient is encouraged in the belief that the operation was simple, too simple to be worthy of much discussion. Elimination is encouraged by enteroclysis, pain is relieved by morphine when it reaches the degree of producing restlessness, water is given freely by the mouth, and food is withheld until there is true and proper craving for it—always for one day, often for two, at times for three or more. The reason for this is shown by Dr. Landon. As a rule after all operations half-normal salt solution is given by slow enteroclysis, a pint every third hour; this to encourage kidney activity. Water is given as called for by thirst.

No effort is made to move the bowels until the third day. The patient is gotten out of bed in accordance with the principles of common sense. Thus a complete breast excision is often up on a chair the day after operation and walking about the next day, while a removal of an appendix goes home, as a rule, on the seventh day. There is, however, no fixed rule in regard to getting the patient up, and if there is reason for keeping him in the recumbent posture, as, for instance, after a radical cure for hernia, the confinement may last two or three weeks. Except this be clearly indicated, the idea which is still too prevalent, that a period of some months is necessary before complete convalescence can be established, is brushed aside as a superstition of another day.

As to the choice of food after operation,

the general feeling has been that milk is not well tolerated, except by certain patients who are habited to it and with whom it agrees. The mere belief that something should be taken to sustain strength is not regarded as nature's craving. When this latter condition is felt it is a fairly safe index as to the readiness of the stomach to play its part in digestion. Such craving may not be felt till the third day. When it develops the patient is asked what he likes, what habitually agrees with him; and from this list, with some restriction, he is allowed to choose, small quantities being given at first.

As to medicine, excepting morphine, which is used in sufficient doses to accomplish its result—*i.e.*, rest from harassing pain—very little is given. When there is insomnia, in the absence of pain, and this sometimes occurs, veronal and trional are the remedies of choice. If after the third day and a free movement of the bowels the patient has no appetite or desire for food, nourishment is given in small quantities with dilute hydrochloric acid and nux vomica and essence of pepsin. In cases of pronounced anemia iron and arsenic are given; in intracranial or spinal operations, hexamethylenamine.

TREATMENT OF VERNAL CONJUNCTIVITIS.

BY AARON BRAV, M.D.,
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Vernal conjunctivitis is not very rare in this country; in fact, we find it more frequently than is usually supposed by various authors. It is observed in both private and hospital practice to a considerable extent during the spring and early summer months. While this form of conjunctivitis, like trachoma, is essentially a chronic disease, it is subject to acute exacerbations during the months of April, May, and June. It is during this period that the patients suffer considerable annoyance. In fact, during the winter months and the cold season of the year the patients usually feel no inconvenience at all, and do not consult the physician until the acute exacerbation sets in. It is a disease entirely influenced by season, and in this respect one cannot but look upon it in an analogous manner with hay-fever. The resemblance to hay-fever is striking, and one may even suspect, as in hay-fever, that the growth of some plant or flower plays a considerable rôle in the etiology of the disease.

The prevailing idea that the disease is caused by the ultraviolet rays of the sun is not sufficiently established and is open to a series of objections. Clinical evidence warrants the assertion that at the bottom of this disease is some germ that appears during the spring months, affecting those who have some special predisposition for this disease. During the cold season the disease is in a quiescent state, giving rise to no inconvenience, and in some cases no changes of any kind can be seen during the winter season. The eye may be perfectly normal during the cold season and yet show considerable changes and produce considerable annoyance during the spring. The disease is very often diagnosticated as trachoma. This frequent mistake in diagnosis swells our trachoma list and is responsible for the prevalent idea that vernal conjunctivitis in this country is a rare disease. Vernal conjunctivitis is a chronic disease of the conjunctiva that recurs periodically every spring in the form of an acute exacerbation.

Three distinct clinical types can be observed, although there are several other manifestations of the disease which constitute merely a milder form. The symptoms during the acute stage in a typical case are as follows: Intense itching, so much so that the patients continually keep on rubbing the eyes. The itching is still more marked in the evening or in the presence of artificial light. Photophobia is also marked. The patient also complains of a burning sensa-

tion. The lids are usually glued together in the morning, and there is some discharge, which, however, is not in proportion to the other symptoms. This discharge is not of a mucous or mucopurulent character, but rather of a gelatinous nature, and looks like soft gelatin. The nature of the discharge is practically pathognomonic of the disease and serves as a point of differentiation from acute catarrhal conjunctivitis. A very characteristic symptom is the discoloration of the bulbar conjunctiva; one can practically diagnose the case by this discoloration. The bulbar conjunctiva assumes a brownish and in some cases a bluish-brown tint; this is the case especially in the bulbar type of the disease. The conjunctiva shows several places of proliferation, and is covered with several broad, elevated papules, which look as if they were lifted up from underneath the conjunctiva. The conjunctiva is as a rule not congested, but rather somewhat pale, considering the presence of an inflammation; with a proliferation of the conjunctival or subconjunctival tissues one would expect a congested conjunctiva, as is the case in other conjunctival inflammations. This is also an important diagnostic point to differentiate it from trachoma. I have never been able to convince myself of the so-called milky membranous cover which is mentioned by all authors. Textbook writers have a tendency to copy every symptom that has ever been mentioned, even though not observed by the author.

Three distinct types of this disease must be carefully considered, namely, (1) the conjunctival, (2) the bulbar, and (3) the corneoscleral type.

In the conjunctival type the chief changes are noticed on the palpebral conjunctiva. Here we observe the various papules arranged in the form and shape of a layer of cobblestones. They are not granulations and appear pushed up from under the conjunctiva. They are flat elevations, occurring chiefly on the tarsal conjunctiva, varying in number and size. These flat hyperplasias are of a harder consistence than the follicles seen in follicular conjunctivitis. Some of them are very large, having a small pedicle, and can be removed with a pair of scissors. Some are as hard as cartilage. The clinician can at a glance differentiate them from trachomatous granules. They appear chiefly on the tarsal conjunctiva. Very rarely are they seen on the lower lids, excepting when there is a mixed condition present, which is very infrequent. On the lower lids we find them in the shape of follicles similar to those observed in follicular conjunctivitis. In this form too the ocular conjunctiva shows a peculiar discoloration, brownish or bluish-brown in hue. The discharge, which is gelatinous in nature, is not marked except in the morning, when the lids are found glued, and the discharge appears mucous in character in the inner corner of the eye. The inflammation is not marked and is out of proportion to the symptoms and complaints of the patient.

The bulbar type presents all the subjective symptoms, but objectively we find only the discoloration of the bulbar conjunctiva and the gelatinous discharge. Occasionally on everting the upper lid we may find one or two small, flat papules on the tarsal conjunctiva. Sometimes we may find nothing except a reddening of the bulbar conjunctiva, the palpebral conjunctiva being perfectly normal. There is no pain, but marked itching is present. I have never seen marked follicles in the retrotarsal fold excepting where there was a mixed infection, or where there was a vernal conjunctivitis superadded to a previous follicular conjunctivitis.

The corneoscleral type presents changes in the corneoscleral junction accompanied by either the other forms or, as often happens, without involvement of either the palpebral or bulbar conjunctiva. We find in this type a hyperplasia gelatinous in nature covering the corneoscleral junction in part or throughout the entire circumference. This gelatinous elevation or proliferation may cover part of the cornea, making the cornea appear smaller. There is no ulceration visible. To the tyro it may appear as an arcus senilis. There is, however, no actual change in the corneal tissue, and

after the disease has run its course the cornea becomes clear again, the elevation disappears, leaving no sign behind, and the eyeball resumes its normal condition. In this type we find a distinct bluish-brown discoloration of the sclera. The discharge is marked and the itching severe and intense. If there is no corneal ulceration—and there is very rarely actual corneal involvement—the disease subsides with the incoming of cool weather; in fact, if treated intelligently the condition entirely disappears during the winter, only to recur during the coming spring or summer. This condition, while found mostly in children, is also seen in adults. Of the 24 cases I had the chance to observe within the last three years, ten were in adults ranging from the age of eighteen to thirty-two. In children it is usually associated with enlargement of other glands in the neck.

The condition can easily be distinguished from trachoma and follicular conjunctivitis by the history, the nature of the discharge, and the character of the elevation. In trachoma the granules appear as if they were strewn on the conjunctiva the same as mortar is placed upon a wall, while here the elevation is pushed up from under the conjunctiva. The papules are larger and harder and flatter. The discharge is not purulent but gelatinous in nature, like soft jelly in its fluid state. The disease is not contagious, and I have not seen any transference from one case to another. The prognosis is favorable and the patients usually recover, leaving behind no trace of its existence.

ETIOLOGY.

Of the etiology, origin, and primary causal element, nothing definite is known. Saemish has established the periodic exacerbation, although the disease was first described by Arlt (1846). It is not contagious. It is usually bilateral, although occasionally it may be unilateral. The different forms of the disease may be observed in the same patient at different periods. Not infrequently it may happen that one eye manifests the conjunctival while the other shows the bulbar type. Clinicians attribute the disease to the ultraviolet rays, but this idea has not been established with definiteness. It is found in all climates and countries. Clinical evidence inclines me to the theory that the disease is caused by some germ that comes with the growth of some flower or grass, affecting those predisposed to the disease somewhat analogous to hay-fever. The periodicity of the disease very strongly points in that direction. I have not been able to observe any transference of the disease from one person to another. It is more frequently found in the male sex, but the female is by no means free. The relation of the sex is probably about three to one. The course of the disease is rather long, as it recurs annually for many years, and then disappears entirely, leaving no trace behind.

TREATMENT.

The treatment is palliative, and must be directed to relieve the annoyance of the patient, and keep him as comfortable as possible, during the hot or warm season of the year. Silver nitrate, which is of great benefit in the catarrhal form of conjunctivitis, is of no benefit in these cases, and in fact does harm by increasing the irritation. Strong cauterants such as copper sulphate, especially the blue pencil, are contraindicated and should not be employed. Our primary object in these cases should be to relieve the itching. Considering the fact that this symptom is never present in the cold season, one would naturally think of the application of cold as a beneficial agent. Clinical experience corroborates this idea. Cold applications applied daily give considerable relief. I am in the habit of advising my patients to bathe their eyes several times in ice-cold water during the day, and invariably I find that their burning sensation and their itching are practically relieved. It may not be amiss to mention the fact that the bathing in cold water also acts as a cleansing agent, removing what little discharge there is in the conjunctiva, and thus greatly increasing the comfort of the patient. Various drugs in the form of lotions have been recommended for the itching. Wicherkiewicz advises a 5-per-cent solution

of antipyrin. Acetic acid, from one to twenty drops to the ounce of water, has been used by many with success. I have tried practically everything advised by various clinicians, with very little success. Chinosol has given me no result. The best result I have obtained from the following routine of treatment. At the first visit I give a mild astringent:

Zinci sulphat., gr. j;
Acidi borici, gr. xxx;
Aqua mentha pip., ʒj;
Aqua destillata, q. s. ʒiij.

Bathe the eyes t. i. d.

In the interval between I advise bathing with ice water, and prescribe also argyrol:

Argyrol, 20 per cent, fʒij.

One drop in each eye t. i. d.

The best local application in the office is a 25-per-cent solution of boroglyceride; this invariably is followed by relief and keeps the patient in a comfortable condition. In the beginning I make this application every other day, and then increase the interval as the patient improves. After this treatment for a week or two I change for the following lotion:

Acidi borici, gr. xxx;
Adrenalin 1:1000, ʒij;
Holocain, gr. v;
Aqua camphora, ℥ss;
Aqua destill., q. s. ʒiij.

Filter solution.

I also prescribe:

Boroglycerite, 5 per cent, fʒj.

Sig.: One drop in each eye t. i. d.

Of course this preparation is burning, but is followed by a soothing effect, while the itching is totally relieved.

When the eyelids glue together, and this is usually the case before treatment is instituted, it is advisable to apply locally some fatty substance—lanolin or petrolatum, simple or medicated, at night-time to prevent gluing of the lids.

I do not think that surgical interference is warranted except when, as sometimes happens, there are present some large papules overhanging with a pedicle, when it is best to remove them by means of curved scissors, as they act as an irritant to the conjunctiva. Surgical interference such as grattage, as advised by some, is not very successful. The disease usually recurs in the form of a bulbar or corneoscleral type, and the patient is kept out of work after operation for several weeks—in fact, it takes a month to fully restore the eye to a normal condition after grattage operation. To prevent recurrences the best thing to do is to keep on treating the patient during the winter season, although often this too fails to accomplish the desired end, and one has to wait until the disease has run its course, as it seems to be self-limited. The general condition of the patient must be looked after. There is no doubt that some constitutional dyscrasia constitutes an important predisposing factor in this disease. We often find children with vernal catarrh ill nourished, with enlargement of the cervical glands and other scrofulous manifestations. In these cases it is best to build up the patient with nourishment and internal medication. I find the following tonic useful in children:

Syrupi ferri iodid., ℥ss;
Liquor potassii arsenatis, ʒj to ʒij;
Syrupi hypophosph. co., ℥ij;
Essentiæ pepsinæ, q. s. ʒiij.

Teaspoonful t. i. d.

For the phothophobia smoked glasses should be advised. Regular and plenty of sleep and fresh air are essential for a cure.

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EDITORIAL.

THE RELATION OF SUPRARENAL INSUFFICIENCY TO THE PERNICIOUS VOMITING OF PREGNANCY.

The remarkable advances which have been made in our knowledge of the physiological activities of those glands of the body which have an internal secretion have opened up new fields for investigation and new methods of treatment. In some instances the hope for therapeutic advance has not been attained. In others the results have been most brilliant. In a considerable number of instances it would seem that better results will ultimately be obtained when our knowledge is sufficiently advanced to make our diagnosis more accurate and our treatment more intelligent.

A number of observers have reported good results from the use of the thyroid gland in the treatment of the toxemia of pregnancy, and in *La Presse Médicale* of December 11, 1912, Sergent and Lian contribute an interesting paper upon the lack of suprarenal secretion as a factor in the vomiting of pregnancy. After pointing out the gravity of this condition, in some cases, and naming the various theories which have been brought forward to explain it, they conclude that the theories which deserve the most consideration are those which believe that it is purely a reflex phenomenon occurring in a neurophile patient, that there is a toxemia, which theory at the present time is receiving much more support than the reflex theory which we have just referred to. Closely connected with this theory is that of Pinard, who thinks that the toxic condition which induces vomiting is due to insufficient hepatic action. This theory has a large number of supporters. Then, too, there are others who have believed that the condition depends upon some perversion of ovarian secretion or of the function of corpus luteum, and finally still others who believe with Sergent and Lian in the view that suprarenal insufficiency is responsible in at least a certain proportion of cases. It would seem probable that these cases are divisible into two great classes: those which are reflex and comparatively mild and fleeting, and those which are toxic and correspondingly grave and persistent.

Sergent and Lian quote observations made by a number of investigators upon the use of adrenalin in the treatment of the toxic type. Thus, four cases which had reached the third month of pregnancy had presented for two months incoercible vomiting which had resisted all the ordinary methods of treatment, dietetic, medicinal, and psychic. One of these was treated by producing abortion, but two of them received adrenalin, with the result that the vomiting speedily ceased, in one case in two days and another in ten days, and still another case in twenty days. Two cases are also referred to in which disappearance of the symptoms was very rapid and the amelioration was almost immediate. Altogether the article gives a large bibliography dealing with this subject.

The following cases may be taken as types of the results obtained: A woman of twenty came under Sergent's care with a history that her father and mother died of tuberculosis. She had never been seriously ill, but was always frail, and as a young girl was very anemic. Married at 17½, she had a child after 18 months. In the pregnancy under consideration she was seized during the second month with severe vomiting which lasted a number of days, incessantly, and produced such exhaustion that she had great loss of weight and semisyncope for ten days. She was pale, wasted, the eyes hollow and brilliant. There was pain on palpitation in the epigastrium. The blood-pressure was low and the urine was not albuminous. The treatment at first consisted in absolute rest, the administration of calcium salts, chloroform water, and inhalations of oxygen. This method of treatment failing at the end of two days, he administered one milligramme of adrenalin; the same day the vomiting diminished, and three days later the patient was

able to take food. Ten days after the patient came under treatment the adrenalin was stopped, there being a marked improvement in blood-pressure, but nine days later the vomiting returned and was excessive on this occasion. One milligramme a day of adrenalin was ordered, and again the vomiting ceased and the condition of the patient continued favorable. In four other cases while the urine was not albuminous it was very scanty, with profound lassitude, very low blood-pressure, and exhausting vomiting. In all of these the use of adrenalin resulted in prompt recovery. Other cases are also cited in which the administration of one milligramme of adrenalin during the course of a week produced a return of normal arterial pressure and steady improvement.

Sergent and Lian conclude that in certain cases the vomiting of pregnancy is entirely due to suprarenal insufficiency, and that adrenalin therapy is the only rational method of treatment, particularly if the blood-pressure is low and there is a tendency to syncope; and it is their belief that in this type of vomiting the emptying of the uterus is not to be resorted to until the adrenalin has been adequately tried. If it is impossible to give the adrenalin by the stomach because of the vomiting, they recommend that 10 drops of the 1-to-1000 solution of adrenalin be given in normal salt solution hypodermically twice a day, or 20 drops in normal salt solution once a day.

THE PHYSIOLOGICAL AND THERAPEUTICAL EFFECTS OF CAMPHOR.

Many years ago when reading the instructive lectures of Graves of Dublin our attention was attracted by his indorsement of camphor as a remedy of value in combating collapse. Clinical experience in its use since then has made us come to regard it as of very great value under certain circumstances, and we have on more than one occasion called attention to its use in leading articles, and in the Progress columns, of the GAZETTE. During all these years we confess that we have been unable to give a rational and satisfactory explanation of the good results which have often followed its use, and we have been forced to a recognition of the fact that for the time at least it must be employed on a purely empirical basis. It must not be thought that we regard camphor as a cure-all or that its use will set aside a death which seems to be inevitable. The point is that we have frequently seen cases of cardiac failure, shock, nervous collapse, and profound asthenia arising from various causes, such as typhoid fever and carcinoma, rally remarkably under its use, and in a way which seemed to prove beyond all doubt that camphor must be responsible for the improvement, either because the results accrued after all other remedies had failed, or because they developed promptly when other remedies had not been given but camphor had been properly administered.

Our experience has taught us that it is a remedy which speedily loses its influence, and that with each successive dose, employed of course for the purposes which we are discussing, it produces less effect. For this reason we have always taught that it is a remedy to be held in reserve and only to be employed when some condition which is urgent must be met. In the THERAPEUTIC GAZETTE for June, 1912, we criticized the doses which some of the German clinicians seem to be employing, which are often as large as from 5 to 20 grains, and stated that in our use of it we rarely gave more than 2 grains.

It is of the greatest importance that we should have more information concerning the action of this substance, in order that our employment of it may be rational. In the *American Journal of the Medical Sciences* for February, 1913, Heard and Brooks have contributed a paper, which is clinical and experimental in its nature, upon the therapeutic value of camphor. In the early part of this paper they describe a case of wide-spread infection, secondary to a suppurative cholecystitis, in which alarming circulatory breakdown repeatedly occurred

and in which caffeine, strychnine, and camphor were frequently used. They state that the use of camphor was followed in more than one instance by marked temporary improvement in the character of the pulse and in the general condition of the patient, but, finally, as dissolution approached, the drug failed to produce any apparent relief, from which fact we can argue only that while the patient had recuperative power the camphor produced an effect, but with the approach of death, and loss of its influence by repeated injections, it finally failed. This clinical case combined with the knowledge of the constantly increasing mention of camphor in medical literature led Heard and Brooks to undertake an investigation upon various patients, and it is a curious fact that they found that camphor given hypodermically in oil in doses as large as 50 grains failed to produce any definite effects. They conclude that while the drug exercises a favorable effect upon the heart muscle when it is poisoned by chloral, muscarine, or strychnine, nevertheless it should neither be relied upon as a cardiac stimulant nor feared as a toxic agent. It is, however, worthy of note in this connection that the cases in which it was almost always employed were patients suffering from ruptured compensation in valvular disease of the heart, a class of cases in which we confess we have never thought camphor was particularly indicated, and have perhaps never employed it.

The seeming failure on the part of these investigators to find any reason for the advantageous effects of camphor does not, it seems to us, in any way invalidate its use for the conditions which we have indicated. All investigations of a scientific and accurate character are of value, but many of the methods which we employ to-day will doubtless in the future seem as crude as those which were used by the profession one hundred years ago. While it is interesting and valuable to have reports of this character it must also not be forgotten that the body has many vital processes which as yet we are quite unable to study accurately. Our knowledge of the circulation of the lymph is almost as crude as our knowledge of the circulation of the blood before the days of Harvey. While, on the one hand, the importance of the leucocytes as protective agents in the body has been brought to the fore by experimental investigation and by the use of vaccines, our knowledge of the influence of drugs upon leucocytosis, not to mention phagocytosis, is exceedingly limited, and knowledge concerning the influence of medicinal substances upon the bacteriolytic power of the blood serum may be said not to exist. We have no means of measuring the increased activity of those portions of the nervous system which deal with vital functions, and our lack of knowledge of a large part of the function of the sympathetic system of nerves prevents us from gaining any information concerning the influence of many drugs upon this important part of the organism.

Finally, there can be no doubt whatever that many drugs act advantageously not by producing a stimulant or sedative influence upon the circulation, but by equalizing the circulation. In olden times alcohol was thought to do good by acting as a stimulant. Now we know this is an error, but we still know that it does good when properly used and does this good aside from any energy which it may readily yield to the body. This benefit would seem to depend upon an equalizing of the circulation, so that areas deprived of blood obtain it and areas unduly hyperemic are relieved. Probably this is one of the ways in which the nitrites do so much good, since by relieving spasm in certain areas they produce good effects without influencing the entire vascular system at a maximum.

While we therefore welcome researches of the character we have quoted, because they add to our knowledge, we are forced once more to reiterate that while scientific facts are always most desirable, when well-recognized therapeutic measures cannot be explained by scientific research there is no reason for condemning their use or casting them aside.

THE SERUM TREATMENT OF HEMORRHAGIC DISEASES.

Readers of the THERAPEUTIC GAZETTE will remember that we published in its pages a little over a year ago an interesting series of papers by Dr. Howell of Baltimore, Dr. Welch of New York, and Dr. Nicholson of Philadelphia, concerning the newer views anent the coagulation of the blood and the clinical action of blood serum to control oozing hemorrhage either as a manifestation of hemophilia or purpura. So far as we know there is no very satisfactory explanation of the clinical fact that the injection of a small amount of blood serum from another human being or from an animal will often save life which is threatened by one of these forms of hemorrhage.

Elsner and Meader contribute a paper upon chronic purpura to the *American Journal of the Medical Sciences* for February, 1913, with special reference to its treatment with animal serum. They admit that the manner of its action is not clear, and for that matter the underlying cause of the hemorrhage is difficult to determine. Abnormal thinness of the blood-vessel walls, abnormally high blood-pressure, an excessive amount of blood for the capacity of the blood-vessels, inherited predisposition to a faulty structure of the cells of the body and blood, and defects in the mechanism of coagulation have all been assigned as causative factors. As a matter of fact these views are worthy of little consideration except the one which holds that the coagulation of the blood in many of these patients is delayed or imperfect. Elsner and Meader apparently believe that the beneficial effect of blood-serum injections depends upon their carrying into the body cytozymes which influence coagulation, and that the blood platelets contain this ferment or a substance which induces coagulation. The number of these platelets for normal blood is placed at from 250,000 to 400,000 per cubic millimeter, and when freshly shed blood is observed under the microscope these platelets are seen to agglutinate, and delicate fibrils are seen to radiate out from the mass. When beneficial results follow the injection of serum rather than of the blood itself they believe that the serum contains fragments or disintegrate products of these platelets whereby the real zymoplastic or thromboplastic substances enter the body and decrease the bleeding by diminishing the coagulation time of the blood. Furthermore they quote an observation of Duke's which is of interest in this connection, that small injections of toxic substances produce a mild irritation which increases the platelet count in the blood. In their own investigations they found that the injection of rabbit serum acted like a toxic agent in producing a mild irritation, and believe that this may have increased the platelets, since they have observed that these platelets are very numerous after injections of small doses, and that simultaneously with the increase in the number of platelets the condition of the patient materially improves.

SYPHILIS.

This disease, because of its universality, its protean manifestations, and its simulation of infections of other origins, simulation so close as to lead many times to diagnostic errors, has had accorded to it a supplementary part of the *Proceedings of the Royal Society of Medicine* (Vol. V, No. I, Supplement), Mr. Moore dealing briefly with the tendencies and prevalence of the disease from the past to the present day, Mr. D'Arcy Power with the treatment of disease, and Mr. Mott with the relation of the disease to public health.

In his opening address Sir Henry Morris notes that among 10,000 Egyptian skeletons there were no traces of syphilis in a single instance. Moore recalls the fact that the poem of Hieronymus Fracastorius published in Verona in 1530 gave the disease the name by which it is now recognized—Siphilus, a shepherd, being afflicted by the sun-god because of blasphemy. It is asserted that the proof as to the importation of the disease from America is still wanting, the fact being quoted on the authority of a well-known anthropologist to the effect that many thousands of pre-Columbian

skeletons from all parts of America had not shown a single case of syphilitic lesion. Elliot Smith notes that all the cases described as syphilis in ancient Egyptian bones up to August, 1908, were examples of the destructive work of necrophilus beetles which had attacked the bones in the grave long after burial. Three scholars of wide fame have asserted that in classical writings there is not the least syllable that could properly be applied to syphilis. Nor is there any evidence that medieval literature contains such reference.

D'Arcy Power, dealing with treatment, accords the modern arsenical preparation second place to mercury, regarding them as adjuvants. He believes that the drug is most efficient in the early stage of the disease, recognizes the prophylactic value of the 30-per-cent calomel ointment and lanolin, and advocates administration of mercury by intramuscular injection.

Mott believes that it is impossible in England to arrive at any definite conclusions regarding the prevalence of syphilitic infection among the population. Likewise it is impossible to arrive at any conclusions relating to the frequency of the incidence of diseases of the nervous system caused directly or indirectly by syphilis. In contrast to this is Blaschko's opinion that in Berlin every man who reaches the age of thirty has (on the average) had gonorrhea twice, and every fourth or fifth man has had syphilis.

Douglas and Melville point to the fact that the number of recruits annually rejected from the army for venereal diseases shows a great and steady decrease in syphilis, from the appalling figure of 16 per 1000 to 1.5 per thousand; whereas there is a steady persistence of other venereal diseases at the level of about 2 per 1000 for the last forty years, rising in the last five years to 3.5, and still apparently increasing. By these figures they conclude "a decrease of all venereal diseases to a quarter of its former bulk, the whole decrease having occurred in syphilis."

It is stated that there are many facts which suggest a certain form of virus with a neurotoxic action. It will be remembered that Kraft-Ebing strongly supported the view that if there were no syphilis there would be no general paralysis, that in support of this he caused to be inoculated with a hard chancre nine persons suffering from this disease, who had never shown any signs and gave no history; not one of these was infected, for they showed no signs although they were watched for a considerable time. It was concluded they had an acquired immunity. There is cited the instance by Brosius of seven glass-blowers suffering with chancre of the lip, and out of five who came under observation ten years later four suffered with either tabes or general paralysis.

It is held that a race long syphilized is, on account of a racial immunity, more liable to suffer with the late degenerative forms. Lambkin reported in regard to the syphilization of the natives of Uganda, showing how severely a race previously free from this disease suffers from malignant skin, bone, and visceral disease, while parasyphilitic affections are rare.

In regard to heredity Fournier remarks the birth of healthy children is "no free pass for future offspring," and instances cases in proof. It is noted that in about 20 per cent of juvenile general paralysis the father has died in an asylum of general paralysis. In 60 cases of juvenile general paralysis Mott has met with no instance in which the mother died of this disease. In other forms of insanity due to neuropathic taint the mother transmits twice as frequently as the father, and daughters are affected twice as frequently as sons. When parasyphilis in the form of general paralysis or tabes affects the male, and the wife is not syphilized, the number of living children is not greatly diminished below the normal average. If, however, a married woman is tabetic or paralytic, the reverse is the case. Twenty-four tabetic women who were married or had cohabited had only three living children, 19 born dead, and 32 miscarriages. Ten of these 24 were sterile. Now of 54 married male tabetics or taboparalytics 151 children were born alive, 75 were born alive and died in

infancy, and there were 52 miscarriages or born dead. Kron's observations upon 184 public prostitutes showed that 14 per cent of those syphilitic prostitutes who had reached the age of twenty-five were tabetic, although the text-books teach that tabes occurs very much more frequently in men than in women; this probably on a rigid examination would prove not true.

Mott holds that there is not the slightest question but that if congenital syphilis were not so fatal to infant life the number of people suffering from brain disease from this cause would be appalling. The question of public importance is, does syphilis contribute to a considerable extent to the production of idiocy? Binswanger, whose statistics have been based upon a large number of idiots, gives 9.5 per cent as certain and 12.2 per cent probable of one of the parents. Similar results were obtained by Wildermuth. Ziehen gives 10 per cent demonstrable, and a further 17 per cent probable. A much less percentage is given by Bourneville, Langdon Down, Shuttleworth, Telford Smith, and Brown. However, the examination of the blood serum of idiots by the Wassermann reaction tends to confirm the higher percentage of the German statistics. An important distinction of parasyphilis from syphilis of the nervous system is that the latter does not give a positive Wassermann reaction of the cerebrospinal fluid except in a comparatively few cases, less than 20 per cent; whereas general paralysis gives it in nearly every case (97 per cent) and tabes in about 60 per cent. No matter how long after the primary infection the onset of the disease occurs the reaction is intense. The time between the primary infection and the onset of the disease is on the average ten years.

It is strongly urged that all infants born of parents who are syphilitic or who are suspects, whether the infant presents symptoms or not, should be examined by means of the Wassermann reaction, since it has been shown that many die of convulsions, meningitis, and hydrocephalus in early life, or later develop optic atrophy, deafness, or juvenile general paralysis. Moreover, an estimate of the amount of latent syphilis and its influence in the modification of the effects of syphilis on the race could then be arrived at.

Mr. Jonathan Hutchinson states that a test of the patients treated systematically and regularly by mercury has shown a radical cure in the great majority of instances. Accepting the evidence of the Wassermann reaction, he states that 70 per cent of cases were cured by mercurial treatment with pills.

Harrison is quoted to the effect that after seven courses of injection with "Lambkin's mercurial cream" a positive Wassermann reaction was still obtained in no less than 55 per cent, and that of 111 cases treated by various methods 64 were still "positive." It is concluded that the exact form in which mercury is administered makes little difference, that "the therapeutic effect is practically independent of the form of administration."

Hutchinson holds that there is not the smallest scientific reason to be adduced in favor of the many elaborate systems of treatment with varying numbers of injections interspersed with oscillating intervals. The important point is, when mercury alone is relied on, to keep the patient steadily under its influence for a long time, not less than two years, and the simpler the method of giving it the better. Hutchinson further states that there is abundant evidence that after two intravenous injections the Wassermann reaction remains negative in most cases, from which we may assume that a complete cure has been effected. Granted that mercury achieves the same end if properly administered in about 70 per cent to 80 per cent, nothing is more certain than that it takes a long time to do so, that whatever form is employed the Wassermann reaction will remain positive for many months. Hutchinson therefore maintains that in every case of early syphilis we are bound to advise the patient to undergo two intravenous injections of salvarsan, whether they be followed by a course of mercury or not. In late cases of

syphilis which have resisted mercury and iodide, salvarsan is generally successful, though in true leucoplakia salvarsan fails. Congenital cases are, speaking generally, more resistant to salvarsan than acquired ones; indeed, in some it appears almost impossible to obtain a negative Wassermann reaction. It is stated that the mercurial treatment of syphilis was familiar in India in the tenth century A. D.; that it was unknown in Italy and England before 1490. There was evidently no syphilis among Boccaccio and Chaucer's contemporaries. Hutchinson observes that Timon of Athens, in which there is a striking picture of the effects of syphilis, was a late play of 1608, written by a bitter misogynist who had passed through a period of grave mental and probably physical trial. He ventures to suggest that a satisfactory explanation may be found on the theory that Shakespeare himself was suffering from syphilis.

As to the prevention of syphilis, McDonagh believes that it would be useful to teach all boys the dangers accruing at extramatrimonial intercourse, and that abstinence therefrom does in no way endanger their constitution or detract from their manliness, and to advocate temperance and healthy sport. He would also make venereal disease a notifiable disease.

French states as a fact that in conjunction with alcohol syphilis is responsible for 27 per cent of private and 31 per cent of pauper male admissions to lunatic asylums in the United Kingdom. He further fails to find a close relationship between alcoholism and exposure to contagion quoted by McDonagh, and in order to arrive at an independent conclusion he recently tabulated 461 cases of soldiers admitted to hospital under his care in the past year at Malta, with freshly contracted venereal disease, and found that 203 were total abstainers, 112 consumed less than two pints of beer daily, 46 consumed three pints, and 100 consumed over three pints a day. The points brought out in a lengthy discussion of the papers presented were as to the probable cure of syphilis by the newer arsenical preparations, the great reduction in the incidence of disease, and the need of sequestration of the affected until they are cured, and the importance of intelligent prophylaxis, thus lessening the heavy burden upon the state incident to the treating of syphilitics.

SKIN MOBILIZATION IN PLASTIC SURGERY.

In these days of Thiersch grafting, Wolf whole-skin inserts, and transposition of flaps with narrow pedicles, it would seem that the last possibilities of plastic surgery have been attained. These methods all have their limitations, and some of them leave invariably either disfiguring scars or a surface quite unlike that of the surrounding area. It therefore happens that if a method can be devised which can close by linear or branching lines of suture an area widely denuded of its skin or which can cover without tension an area left by a flap transplantation, the resources of the surgeon will be increased and the best interest of the patient distinctly enhanced. All surgeons have noted that a small wound which cannot readily be drawn together by sutures can be easily and properly approximated providing the skin be undermined about it, the subcutaneous tissues being separated from the deep fascia. Moreover, it is a matter of common observation that a very extensive uplifting of the skin and superficial fascia by an effusion, whether it be of rapid or slow formation, is practically never attended by skin necrosis.

Guided by these observations Morestin (*Journal de Chirurgie,* tome vii, No. 5) started an experimental and clinical research, having for its end the feasibility of a wide separation of the skin and superficial fascia from the underlying tissues for the purpose of filling in huge defects. He found that this was perfectly practicable and was attended by slight bleeding, which was readily checked by packing; that it allowed of an unbelievable degree of skin sliding and greatly facilitated all plastic work. Separation was accomplished by either a knife or scissors, sometimes by blunt dissection, an entire flap being lifted

up forcibly from the underlying parts. Such freeing should be carried to such an extent that the wound can be united by suture without tension. This may imply an undermining of more than a foot from the periphery of the defect. Even a greater distance than this is perfectly safe and feasible, providing the size of the breach to be covered demands it. In very fat subjects the separation may be made through the superficial fascia. The precaution is to be observed invariably that a portion of the fascia should be lifted up with the skin, as otherwise local necrosis is likely to result. The extent to which this procedure can be carried exhibits individual and regional variations. Its principle is capable of such wide application that it should be universally understood and used. It greatly simplifies plastic surgery and is particularly applicable in the neck, thoracic region, and the abdominal wall.

REPORTS ON THERAPEUTIC PROGRESS.

PRACTICAL THERAPEUTICS WITH PARATHYROID IN PARALYSIS AGITANS.

BERKELEY in *International Clinics* for December, 1912, describes cases so treated as follows:

When it came to the practical administration of parathyroid glands to the patient, his first cases were treated with commercial parathyroid gland. This worked well in a few cases, but was found so variable and uncertain in its action that it had to be given up. He next tried a preparation of properly identified glands rubbed up in the crude fresh state to a dry powder with milk-sugar. This was distinctly better, but still seemed to be variable and unstable. Later on he tried a nucleoproteid solution of the parathyroid made up by Beebe's method and preserved with a few drops of chloroform in the bottom of each bottle. This has still further raised the percentage and degree of improvement, but it precipitates rapidly, and is very susceptible to damage from temperatures above 5° C., therefore hardly admitting of transportation to any great distance.

His latest process, devised over a year ago, and giving great satisfaction to a number of patients who had not done well on other preparations, is this: The nucleoproteid is not redissolved, but quickly dried in a draught of cold air; so that within eight or ten hours after the warm glands leave the bullock a minute amount of smooth, yellow powder is obtained which stands physiological tests admirably, is stable, easily handled, and does not require the ice-box for its preservation.

The powder is rubbed up with milk-sugar as a menstruum, and is dispensed in sealed and dated bottles of eighty capsules. Each capsule contains one-fiftieth of a grain of parathyroid nucleoproteid. The average dose is two per day—sometimes less than this where the patient is sensitive to the action of the remedy. This preparation is the best he has so far tried. It will give satisfaction not only in Parkinson's disease, but also in any form of tetany where the stomach can retain food. Otherwise, a sterile hypodermic preparation of the nucleoproteid must be used.

In paralysis agitans there are no special contraindications, though some patients complain of "nervousness," inability to sit still, and an aggravation of their habitual constipation after a few days' dosage. Nothing is necessary in these cases except to diminish the dose and increase again more slowly. Little benefit can be expected of a satisfactory character except from small doses continued over a long period of time—three months or a year.

Patients taking parathyroid require to make no change in their mode of life, diet, or habits not otherwise indicated. Those able to attend to business should be encouraged to work, but with shorter hours, and more frequent periods of repose.

There are a few patients now and then who do much better on the above-named hypodermic preparation than on capsules. The hypodermic solution of nucleoproteid is easily administered, and causes little or no pain or irritation, if given with proper aseptic precautions. Sometimes a capsule may be given in the morning and a hypodermic injection at bedtime—thus securing for the patient a restful night. The base of the solution is sterile normal saline solution. Each cubic centimeter contains one-fiftieth grain of parathyroid nucleoproteid and a trace of chloroform (antiseptic). This method of solution mixes English and metric systems, but practically it is very convenient. Kept in the ice-box, the nucleo-solution retains its efficiency for at least six weeks or two months, and probably much longer.

If the patient has gotten any relief from hyoscine before beginning the parathyroid treatment, he should continue it afterward. The two work well enough together. The dose of hyoscine, its successes and failures, have been written up many times before, and the author need only comment here upon the necessity of using a pure drug. The dose of hyoscine in paralysis agitans is often made needlessly large—1/200 grain is generally effective. Occasionally duboisine may work better than hyoscine. Hyoscine makes many patients so wretched in other ways that they refuse to take it. Delirium is a common symptom, and in the later stages of the disease urinary retention with overflow may occur. This should be carefully watched for.

Of the numerous remedies for chronic constipation, enemata and one or another form of the extract of *Rhamnus purshiana* will prove most reliable in the long run. The patient generally finds out for himself what suits him best. Calcium salts by the mouth have produced no benefit, Berkeley asserts, in his hands. Hypodermically he has gotten no results except local induration and threatening abscess. Intravenously he has found no patients willing to try it. Morphine, administered hypodermically, may be given in small doses and infrequently for a long while without great harm, and its employment should not be too long postponed when other remedies fail.

Of mechanical remedies, passive motions, warm baths, and general massage of the limbs and trunk (secundum artem) are helpful, but the front of the neck should on no account be massaged; an excess of thyroid secretion is thus liberated in the system and the patient grows rapidly worse.

Active exercise is of value in all patients who can take it without too great pain or fatigue. No exercise that overfatigues is good. A daily airing in a wheel chair or a carriage (not a motor-car) is essential for those who cannot walk. For patients with sufficient means extensive traveling by easy stages is often of great benefit. The mental surroundings of the patient are very important. He should be cared for with sympathy and cheerfulness, and in the common event of psychasthenic "fear," "nervousness," or mental depression, an appeal to the reason, a resort to the consolations of religious faith, and such other rational resources as may be available, will prove of marked assistance.

As regards diet, Berkeley has made a multitude of experiments. He has kept patients upon an exclusive meat diet, an exclusive vegetable diet, an exclusive milk diet, a diet free from calcium, a diet rich in calcium—all without the least effect upon the patient's condition. This is comparable to the curious fact that the tetania parathyreopriva of cabbage-fed rabbits is just as violent as that of meat-fed dogs. He has finally concluded that the patient should be encouraged to eat freely of a mixed diet—taking in moderation anything that agrees with him and does not aggravate his constipation. When stimulants have been required, aërated Scotch whisky has given his patients more general satisfaction than aught besides.

After resort has been had patiently to a sufficiently long course of parathyroid treatment, and when this medication has been rationally supplemented by one or more of the other expedients above suggested, the patient generally attains, within

six months or a year, to a stationary condition—not, Berkeley thinks, of "cure," but of very fair comfort—and remains thus for an indefinite period. If one recalls the pessimism with which the treatment of this dreadful disease has been universally regarded in former years, he believes it is not too much to say that medication with properly identified parathyroid has wrought a revolution.

SOME THERAPEUTIC PRINCIPLES BASED ON OUR PRESENT KNOWLEDGE OF RENAL DISEASE.

BARKER, in the *American Journal of the Medical Sciences* for January, 1913, tells us that in the nephropathies, perhaps more than in diseases of other parts of the body, it is easier to ward off a malady than, once it is established, to cure it.

To prevent the ascending (urinogenous) nephropathies we try to prevent (1) all obstructions to urinary outflow, and (2) all infections of urinary passages. When an infection of the lower urinary passages exists, we may try to prevent an ascent (1) by proper treatment of the primary infection, and (2) by copious water-drinking, and the use of hexamethylenamine. In women, some of the infections of the bladder and of the pelvis of the kidney with bacillus coli communis may be due to chronic constipation.

To prevent the descending (hematogenous) nephropathies, we have to learn how toxemias and bacteriemias may be avoided.

Thus, the prophylactic measures to be taken against the toxic tubular nephropathies (sublimate-kidney, chromate-kidney, phosphorus-kidney, etc.) are obvious. How to prevent the pregnancy-nephropathy in the people who are prone to it we do not yet know, but the knowledge that it is due to absorption from the cavity of the uterus, and that emptying the uterus, in the majority of cases, cures it, stands us in good stead. And since the toxic glomerular nephropathies—the true glomerular nephritides—are often due to streptococcus toxins, the possibility of the complication should be thought of in every case of streptococcus infection. It arises most often after streptococcus sore throat. Here the general practitioner can do much in the way of prevention. Every individual who suffers from sore throat, tonsillitis, or a "bad cold" with fever, should be put to bed, and be kept warm there, until the infection is overcome. Not only would much renal disease be thus avoided, but also many serious diseases of the heart and of the joints. If infections of the tonsils keep recurring, the risk to the kidneys, endocardium, and joints is very great; in many cases it may be wise completely to excise the infected tonsils. Other foci of chronic infection should be watched for, and, if found, removed (sinusitis, pyorrhea alveolaris, abscesses of the roots of teeth, otitis media, chronic appendicitis, chronic cholecystitis, chronic prostatitis, chronic salpingitis, etc.).

After scarlet fever, patients should be kept in bed for at least four weeks after the onset of the disease, and from the middle of the second week on the body should be kept warm, and only warm baths should be given, the patient's diet consisting of milk and cereals.

The focal nephropathies, due to bacteriemias, could doubtless often be avoided by preventing, or properly treating, the primary infection preceding a bacteriemia. But we have far to go before we shall learn how to do this in all cases.

Most important at present, perhaps, are our attempts to prevent what Barker has designated as the arteriolar nephropathy, or genuine contracted kidney due to atherosclerosis of the small arterioles. Prophylaxis here should be directed toward the conditons (toxic) which give rise to the premature atherosclerosis of the arterioles of the organs. Particularly in families in which there is a history of the disease in one, or several, of its members, precautions should be taken early. Overindulgence in food, especially protein food, in alcohol, in tobacco, and in the pleasures of sex and work may be warned against; if arterial hypertension has already appeared, a strict régime should be instituted and maintained.

In the treatment of renal diseases, the

dictum of Traube still holds good: "Protect the kidneys and control the heart." In addition to the principle of protection, we can also, at certain stages, successfully apply the principle of exertion to the renal function.

In the protective therapy we avoid, as far as possible, all further injury to the kidney by intoxication (lead, gout, alcohol, etc.) or infections (chronic tonsillitis, anginas, etc.), and we can lessen also the amount of work thrown on the kidney, in normal metabolism, (1) by choosing a suitable diet (limitation of proteins to 100 to 125 grammes meat or its equivalent, of water to 2 liters, of sodium chloride to 8 to 10 grammes, and irritating condiments; (2) to a slight extent, by increasing the eliminatory functions of other organs (skin, intestines, lungs); and (3) by lessening the amount of physical or mental work done each day and advising periods of rest, lying down, in the middle of the day. In cases in which the renal disease is compensated, such protective measures are all that is necessary.

To get patients well started on a suitable dietetic regimen, the foods should at first be carefully weighed or measured. For this purpose it is very helpful to enlist the aid of nurses especially trained in dietetics.

In every case of renal disease, the condition of the heart should be carefully watched. Indeed, chronic passive congestion of the kidneys, due to cardiac insufficiency, may of itself cause marked albuminuria and cylindruria. The albumin, as well as the casts, may disappear from the urine when cardiac compensation is reestablished. And when the kidneys themselves are diseased, the urinary symptoms may be markedly exaggerated if the heart begins to fail. "Every renal patient is also a cardiac patient;" in treatment, this should always be kept in mind.

The treatment of cardiac insufficiency Barker does not go into at this time, as he has already dealt with that topic in a former paper. When the renal disease is not compensated, the kidneys having become insufficient, the rest of the body begins to show certain ill effects, of which the two most important are (1) edema and (2) uremia. In such cases we must make our protective régime still more rigorous, often keeping the patient in bed at complete rest for a time; in addition, we may find it necessary to stimulate renal excretion by diuretics which improve the blood flow through the kidney and excite the renal epithelial cells to increased work.

In combating edema in renal disease, we use diuretics, a salt-poor diet, mild purgatives, and when necessary heart tonics. Diuretin, and the still more powerful theocin, are both excellent stimulants to the renal epithelium, while digitalis preparations improve the circulation in the kidney. In giving diuretin, a dosage of 0.5 gramme at 2 P.M. and the same amount at 5 P.M., every other day for a few days, may suffice; if not, as much as 4 grammes may be given in one day. In giving theocin, 0.1 to 0.2 gramme at 10 A.M. and at 4 P.M., every other day for a few days, may suffice; if not, as much as 0.8 to 1.10 grammes may be given in twenty-four hours. The renal cells may cease to respond; if so, the medication should be stopped, to be tried again a few days later.

Mild purgation is usually sufficient. Violent purgation is often harmful, exhausting the strength of the patient.

The influence of a salt-free (or salt-poor) diet, in reducing renal edema, is sometimes remarkable, especially in acute cases; but a salt-free diet should never be kept up for a long time, or it will do more harm than good. The intake of NaCl may be reduced to 2 or 3 grammes per day; in many instances a reduction to 5 grammes per day may suffice. The patient is told to add no salt to his food, and he may use salt-free bread and unsalted butter, together with one liter or one and a half liters of milk, Sugar, rice, potatoes, stewed fruit, fresh green vegetables, salad, chocolate, coffee, tea, and cereals, if no salt be used in their preparation, are practically salt-free foods. Meat and eggs are also salt-free, but should not be used to any great extent, in such cases, on account of their high protein con-

tent. In the French clinic of Widal, a salt-poor diet consisting of 200 grammes of salt-free bread, 200 grammes meat, 250 grammes vegetable, 50 grammes unsalted butter, and 40 grammes sugar is employed. Such a diet contains 1500 calories, and is sufficient for a patient lying in bed. It represents about 60 grammes of protein—a low value. Barker has seen patients, on a similar diet, lose 20 to 30 pounds in a week, from reduction of the edema. The strict salt-free (or salt-poor) diet should not be continued longer than a week at a time, preferably not over three or four days; then a little more salt (1 to 3 grammes) may be permitted, but as far as possible the individual tolerance should be determined and the patient kept within it. When the patients have a high tolerance for NaCl, there is no good in restricting the salt intake to very small amounts.

In the treatment of uremic symptoms similar principles are followed, namely, vicarious elimination by mild purgation and diuresis, cardiac tonics, protective diet. When uremia is threatened, it may be well to limit the food for a short time to milk-sugar, dissolved in water, and fruit juices; later milk may be added. In some cases of uremia, venesection may be life-saving; when convulsions recur frequently, lumbar puncture may be tried. In uremic asthma a small dose of morphine may be necessary. If there be insomnia, or marked nervousness, we may give 0.1 gramme of veronal at 2 P.M., at 5 P.M., and at 8 P.M. for a time.

In the management of contracted kidney we attempt to prevent further action of the cause (atherosclerosis; streptococcus intoxications). To combat a developing atherosclerosis, the whole mode of life has to be systematically ordered. A lactovegetarian regimen is instituted, and several small meals per day substituted for three large ones. Constipation, if present, is overcome, as is also abnormal intestinal fermentation (administration of bacillus bulgaricus). The blood-pressure should be watched, but it must be borne in mind that the hypertension is a compensatory process, rarely to be combated directly by the high-frequency current or by vasodilating drugs (nitroglycerin, sodium nitrite, vasotinin), but, as far as possible, by a prevention of the intoxication which causes it—that is to say, by dietetic and general hygienic measures. Above all, the strength of the heart must be maintained, for unless he die from an apoplexy, the patient suffering from contracted kidney sooner or later suffers from cardiac insufficiency. When this begins to appear (dyspnea; cardiac edema), or if uremia be threatened, complete rest and digitalis therapy are indicated; diuresis may be favored by diuretin or theocin, the bowels kept open by mild laxatives, and the skin active by warm packs. Violent sweating is to be avoided.

In contracted kidney the patients usually pass large quantities of urine. Sudden reduction of the amount is usually a bad sign; it may indicate either a failing heart or an acute nephropathy superimposed upon the contracted kidney.

If his life be well regulated, a patient suffering from contraction of the kidneys may go along for many years, even for decades, in comparative comfort, especially if he choose a good climate to live in and avoid infection and chilling of the skin.

CARDIOLYSIS.

SIMON in the *British Medical Journal* of December 14, 1912, tells us that the selection of a suitable case for this treatment involves the greatest care and prolonged observation. It is difficult enough to diagnose an adherent pericardium when the fibrous bag is united inseparably to the serous covering of the heart muscle, but to feel sure that in addition there are external adhesions to the chest wall and to the diaphragm is a most serious problem. It is a difficulty that must be faced, however, or the operation will be discredited and possibly some lives sacrificed. Probably the best way to succeed in making a diagnosis is to determine if there is any way of explaining the increased size of the heart as due to any other cause than old pericarditis.

These cases occur almost entirely in

young people at the time of development, in whom it has been known that they have been suffering from heart disease of some standing. Generally speaking, disease of the aortic valves, Bright's disease, and adherent pericarditis are the only causes of hypertrophy of the heart in children; it is fairly easy to satisfy oneself as to the existence of either of the first two causes, and so, by methods of exclusion, arriving at the diagnosis of old pericarditis. Chronic myocardial degeneration will cause dilatation of the heart and an increase in the area of precordial dulness, but it is rare in children; it may occur, but is seldom rapid in its course. Adhesions of the pericardial membranes must in course of time result in myocardial changes, but, as already stated, they are slow in development, and simple pericardial adhesions may, and often do, exist for many years without imperiling life; so, if in a youth we find a fairly sudden and rapid failure of heart power, and are able to exclude disease of the aortic valves as accounting for the hypertrophy, we are forced to consider the question of external adhesions.

We are helped materially by two very important observations—the nature of the impulse and the movements of the diaphragm. The latter can be observed in two ways—by radiography and by the movements of the abdominal wall. In inspiration the diaphragm descends, pushing before it the abdominal wall; if this movement does not occur, the inference is that the diaphragmatic contraction does not take place, because it is adherent to the pericardium, which maintains an almost constant position, owing to its relation to the root of the lungs and the aorta and pulmonary artery, though its junction to the central tendon of the diaphragm causes it to descend a little when the diaphragm descends.

The impulse in these cases is often very diffused, and the apex of the heart can generally be felt in the same position, not moving if the patient changes his position and lies on either side, the whole pericardium being anchored and fixed by adhesions. The limitation of diaphragmatic movement has a very important bearing on the liver. Physiologically, it is compressed by the descent of the diaphragm, and in its turn presses on the vena cava, so that the blood from the hepatic veins is pumped up through the inferior vena cava into the right auricle. If the diaphragm does not act, this free passage of blood does not take place; it is dammed up in the liver, which becomes swollen, and, as in one of Simon's cases, may be felt as low down as the umbilicus. If, therefore, in a patient who has been known or suspected to have adherent pericarditis we find such enlargement, and this is not due to cirrhosis, we may feel pretty confident that the diaphragm is adherent to the pericardium, especially if the diaphragm moves less than normally, and the anterior wall of the abdomen does not protrude with inspiration.

The vena cava passes between the right and central lobes of the central tendon of the diaphragm, and it is more than likely that its shape may be altered and its lumen diminished by an increase of the connective tissue of the tendon, due to inflammatory proliferation.

This leads Simon to express the hope that it may be possible, by means of removal of this pressure on the vena cava, to still further increase the relief that the present operation of cardiolysis has rendered. It would, of course, necessitate a second operation on the right side, and it may indeed be impossible, as the vena cava is deep in the thorax and has very intimate relations with the phrenic nerve. Mr. Billington, resident pathologist at the General Hospital, has been kind enough to make a number of investigations for Simon on the relations of the inferior cava in the thorax, and finds that there is a very appreciable length of the vein, an inch or more, which is to be seen in the thorax between the points of piercing the diaphragm and entering the heart.

All the older text-books speak of the vein as passing through the diaphragm and entering the pericardium immediately. This is certainly not the case, as the vein can be distinctly seen as stated for three-quarters

of an inch before it pierces the pericardium; the rest of it, comprising about one-half inch, is within the pericardium and partially covered by the serous sac. The later textbooks speak of and illustrate this fact.

It is just this first part which may be affected by adhesions of the right pleura, which are very apt to occur in cases of anterior mediastinitis secondary to pleurisy or pericarditis. It is to the possibility of dealing with this condition that Simon ventures to draw the attention of surgeons. The vena cava, when it leaves the diaphragm, is extra-pericardial and is covered by fibrous tissue; what this fibrous covering is seems doubtful. It may be a derivative from the diaphragm or from the fibrous bag of the pericardium, or be independent of both. It is not covered by the pericardial serous sac until about one-half inch before it enters the right auricle. This three-quarters of an inch of vena cava, which has as yet no connection with the serous sac of the pericardium, is therefore very likely to be affected by any proliferation of connective tissue, such as occurs in mediastinitis; but it is equally obvious that adhesions of the two layers of the serous sac—namely, that overlying the heart muscle and that lining the fibrous bag of the pericardium—cannot affect this part at all.

It is possible, therefore, to understand why internal adhesions of the pericardium may occur without inducing any signs of pressure on the cava, such as obstruction to the entrance of the blood into the right auricle, and consequent increase in size of the liver. When such signs occur it would follow that we may assume that external adhesions have been formed. This interpretation, if correct, would explain why sometimes chronic pericarditis may exist for years without producing any symptoms until gradually those of progressive myocardial degeneration assert themselves, and, on the other hand, why very rapid signs of heart failure without general valvular lesions may probably be found to be dependent on external pericardial adhesions.

It is in this latter type of case that cardiolysis may be expected to prove useful.

The anatomical conditions of the vena cava superior as regards its relation to the pericardium are exactly like those of the vena cava inferior, but the symptoms associated with pressure upon it will be those of delay of the venous circulation in the face and neck.

Cyanosis, which was so marked in one case, disappeared at once after the operation.

No attempt was made in his case to look for adhesions to the diaphragm or the veins, so it is clear that the beneficial result was due to the increased freedom of contraction of the ribs, and by separation of the adhesions between them and the pericardium.

A METHOD OF RAPIDLY EXTERMINATING PEDICULI CAPITIS.

WHITFIELD gives the following directions in the *Lancet* of December 14, 1912. He well says that although pediculus capitis is extremely common and not infrequently attacks the well-to-do, it is not generally known that the parasites can be exterminated with very little trouble in a short time. The method Whitfield describes has been in use by him for the last twelve years, and was described in the small handbook of skin diseases which he published in 1907. As, however, this description appears to have escaped attention, a short note about it for the benefit of others is worth publication. He was first led to use the method after a conversation with his colleague, Mr. G. Lenthal Cheatle, who suggested to him that probably Lister's "strong mixture" (1-in-20 carbolic solution containing 1-in-500 perchloride of mercury) would be a fatal application to the head-louse. On experimenting with various strengths he finally adopted the following method in the case of female children, in whom treatment is made difficult by the length of hair:

The patient is laid on her back on the bed with the head over the edge, and beneath the head is placed a basin on a chair so that the hair lies in the basin. A solution of 1-in-40 carbolic acid is then poured over the hair into the basin and sluiced

backwards and forwards until the whole of the hair is thoroughly soaked with it. It is especially necessary that care should be taken to secure thorough saturation of the hair over the ears and at the nape of the neck, since these parts are not only the sites of predilection of the parasites, but they are apt to escape the solution. The rule he gives is that this sluicing shall be carried out for ten minutes by the clock. Lister showed that if the hair is soaked with carbolic acid solution for an appreciable time it takes up the phenol and the solution becomes progressively weaker. At the end of the ten minutes the hair is lifted from the basin and allowed to drain, but is not dried or even very thoroughly wrung out. The whole head is then swathed with a thick towel, or better a large piece of common house flannel, which is fastened up to form a sort of turban, and the head is allowed to remain like this for an hour. It can then be either washed or simply allowed to dry, as the carbolic, being volatile, quickly disperses. At the end of this period every pediculus and, what is more important, every ovum is dead, and although the ova are left on the hair they will not hatch, and no relapse will take place unless exposure to fresh contagion occurs. Incidentally any impetiginous scabs are softened so that they come away easily and allow any ointment which is used for the cure of this complication to be applied easily. In cases in which there is no impetigo no further treatment is necessary.

Many methods have been devised for the cure of pediculus capitis, and for some of them it is claimed that they will remove or kill the nits, but the author asserts that having tried a large number he has found none but the method described above which really does so.

About eleven years ago he had an epidemic among his own servants, one of whom had immensely thick and long hair. The infection was discovered late on Saturday night, and on Sunday morning this treatment was carried out. Nothing further was done and no relapse occurred.

About a year ago he was asked by a friend of his, a physician to one of the London medical schools, if he knew of any certain way of eradicating the pest. His little girl had stayed in a farmhouse and had become infected about eight weeks previously. She had been under the care of a specialist, who had tried more than one method, and at the time that he consulted Whitfield his wife was combing the child's hair daily with a fine-toothed comb and cutting out any hair on which she could discover a nit, but up to that time unavailingly. He tried Whitfield's method, and reported later that it was applied only once and the case was permanently cured.

He states he is also allowed by Dr. A. M. H. Gray, of University College Hospital, to say that he has been using it for some time with complete success, and that even in the out-patient department, where home treatment is liable to be carried out rather carelessly, he does not remember having seen a single relapse.

Lastly, he mentions that there seems to be no disadvantages to the method. He has never seen carboluria result from it, though he should not advise it in very young children, as it would be simple to clip off all the hair, and it might be risky to use the carbolic; but with children of five years and over it is certainly safe. The hair itself is not in the least damaged, but appears particularly soft and silky after it, a fact which Mr. Cheatle mentioned to him years ago.

If this were made the routine treatment of "dirty heads" in the schools the frequency of the disease would be greatly diminished.

THE PROPERTIES, USES, AND INDICATIONS OF THE VARIOUS CARBOHYDRATES USED IN INFANT FEEDING.

CHAPIN contributes to the *Journal of the American Medical Association* of December 2, 1912, a paper on this important topic. As to the physiologic properties of carbohydrates, when it is thoroughly understood that the final product to be produced from the carbohydrates taken as food is glycogen,

the order of availability of the various carbohydrates will readily be grasped from the following outline of their physiologic properties:

1. Only fermentable sugars form glycogen.

2. Dextrose and maltose when injected subcutaneously are assimilated because the blood contains enzymes that will convert dextrine and maltose into dextrose. Dextrose and maltose are highly fermentable.

3. Cane-sugar and milk-sugar when injected subcutaneously reappear almost entirely in the urine because they are foreign to the blood and cannot produce glycogen until they have been converted into fermentable sugars in the intestines.

4. The relative order in which sugars are available for forming glycogen is: dextrose, maltose, cane-sugar, milk-sugar.

While dextrose has the highest limit of assimilation, too much of it in the food will overtax the liver and cause alimentary glycosuria, as it cannot be converted into glycogen as fast as it is absorbed.

A certain amount of energy is expended in digesting and assimilating carbohydrates, and their relative food value depends on the amount of energy that must be expended in converting them into dextrose. The reason maltose and cane-sugar have greater availability than milk-sugar is shown by the following illustrations of what takes place when they are rendered assimilable:

Maltose + H_2O = dextrose + dextrose.
Cane-sugar + H_2O = dextrose + levulose.
Milk-sugar + H_2O = dextrose + galactose.

Maltose is completely converted into dextrose by the chemical addition of water and is immediately available; cane-sugar when split up is converted half into dextrose and the other half into levulose, which the enzymes of the blood can convert into dextrose, while milk-sugar is converted into half dextrose and half galactose, which must undergo further change before it can be assimilated. The net energy value of maltose is greater than that of cane-sugar, and the net energy value of cane-sugar is greater than that of milk-sugar.

The tendency for fat to be stored after the liver is filled to its capacity with glycogen readily explains why maltose and cane-sugar, which have a higher net energy value, are more apt to cause fattening than milk-sugar, and why a high maltose content in the food is prone to cause diarrhea—it is crowding the liver too much and must be eliminated.

Concerning the adaptation of carbohydrate to the infant's condition, Chapin says that when an infant is strong and vigorous it has a plentiful supply of glycogen in its tissues and liver, and therefore a reserve of energy. Under these conditions milk-sugar, which is slowest to produce glycogen, acts well, as it does not overtax the liver or cause alimentary glycosuria or excessive fat production. When an infant is weak or poorly nourished and its reserve of energy is small, there is a demand for rapid production of glycogen. For such infants dextrose or maltose, which can be taken directly into the blood and converted at once into glycogen in the tissues or muscles, where there is a demand for it, is more effective than milk-sugar or cane-sugar. Maltose is particularly available because it is one of the forms through which all the carbohydrates of the body pass before they are utilized. When absorbed, maltose can be changed into glycogen in the tissues or into glycogen in the liver as conditions warrant. It might be said to turn either to the right or to the left as its presence is needed in either direction.

In this connection it is significant that in the process of adult digestion the first product of the digestive excretions is maltose from the starches by the action of the saliva. Since we know that there is a large expenditure of energy during the digestion of a meal, it is fair to infer that nature intended this energy to come from the food that was being digested and not from energy stored up from a previous meal, and thus provided that the maltose should come from the food and not from the glycogen of the liver. At any rate, it is well established that thorough chewing of a mixed diet renders digestion easier than if the food is bolted.

There can be no question but that by adding products of starch digestion, such as dextrin and maltose, to an infant's food, the same digestive effect is produced as when an adult thoroughly mixes his food with saliva, and that the energy needed for digesting the food can be obtained from the food itself. This may be of advantage when the infant is called on to digest cow's milk, which requires the expenditure of more energy than does human milk, or when the infant is poorly nourished and therefore has no appreciable reserve of energy in the form of glycogen.

In the artificial feeding of infants there are more factors to be considered than the composition of the food and its caloric value, for it has been shown that all carbohydrates have practically the same caloric value, but that they are not equally available, different amounts of energy being called for to render them suitable for assimilation. While it is possible to determine the energy required to render assimilable the food of individual animals experimented on, no law or rule can be established that will apply to all infants, because of individual differences.

A point that should not be overlooked is that the physical condition of the food has a marked effect on its nutritional value, even if it is completely digested. Animal experiments have shown that from 40 to more than 100 per cent of the energy or caloric value of a meal may be expended in digesting it, and Armsby has pointed out that on certain forms of food an animal will die of starvation sooner than if no food at all were eaten, the explanation being that all the energy of the meal and a considerable portion of the stored-up energy are expended in the work of digesting the food.

When infants are fed on cow's milk the problem of energy expenditure in digestion is necessarily different from what it is when human milk is given, because of the differences in the physical properties of the milks after being clotted by the gastric secretion. Clinical experience the world over has shown the advantage of having part of the carbohydrates of the food in quickly assimilable forms.

For nearly twenty years Chapin has practiced and taught this truth, and Keller and Finkelstein have also strongly advocated an application of the same principle, though in a different manner.

All have recognized the necessity of altering the physical properties of the curd of cow's milk in some way; and the addition of alkalies, decalcifiers or antacids for doing this by chemical means or the use of gruels for accomplishing the same thing by mechanical means is almost universally practiced. Finkelstein clots the milk and then passes it through a sieve to obtain the same effect.

All these methods of modifying the character of the curd of milk lessen the demand for energy during digestion. When easily assimilated carbohydrates are added to the food so prepared, energy food is made immediately available and the net value of the feeding is increased.

Conditions so vary with individual infants that Chapin has always believed that the best method of preparing substitute food for them is to use as a basis milk or top milk diluted with cereal gruels of definite strength for the mechanical effect on the curd of the milk, and then by altering the character of the carbohydrates adapt them to the energy and digestive requirements of the individual infant. As glycogen and starch are essentially the same and undergo the same chemical transformations when acted on by diastase, it becomes a simple matter in practice to prepare food in the home that shall call forth all the digestive powers when there is plenty of reserve energy in the infant; and for infants whose reserve of energy is small, a slight change in the method of preparation of the food will alter the availability of the carbohydrates in such a way that the infants will be supplied with such materials as they would prepare in their tissues if they were normal.

These methods are simple, inexpensive, and almost universally applicable, but they must be applied with an understanding of

the purposes various carbohydrates serve in nutrition. They consist essentially in using gruels made from various cereals as a starting-point, and then by means of diastase converting the starch into soluble starch, dextrin, or maltose, as may be required. The extent of the conversion of the starch is to be regulated by the digestive ability and needs of the infant. A nearly complete conversion into maltose is indicated when rapid assimilation is desired. To obtain the maximum amount of maltose the conversion should take place at about 150° F., but when soluble starch and dextrins are sought the temperature should be about 165° F.

RECENT ADVANCES IN OUR KNOWLEDGE CONCERNING THE CAUSES OF GLYCOSURIA.

FUTCHER gives these conclusions in the *Journal of the American Medical Association* of December 21, 1912:

1. It is unwise, from past experience, to accept as settled any new theory advanced to explain the cause of diabetes mellitus.

2. It must now be accepted as positively proved that not only the pancreas but also the adrenals (chromaffin system), thyroid, parathyroids and pituitary have a very important influence on carbohydrate metabolism.

3. Although lesions of the pancreas have been found in a considerable percentage of cases of diabetes, it is now clear that morbid changes in that organ will not explain all cases, even when alterations in the islands of Langerhans are also taken into account. The essential and primary disturbance may be in one or another of the ductless glands.

4. There is undoubtedly a marked correlation of the internal secretions of the ductless glands. Thus the internal secretions of the adrenals (chromaffin system) and pancreas mutually retard the action of each other. The most recent theory concerning carbohydrate metabolism is that first advanced by Zuelzer and now supported by many physiologists. According to this view, one of the important functions of the adrenals is to "mobilize" or set free the carbohydrates in the liver and possibly in other storehouses also. Under normal conditions, however, this influence is counteracted or exactly balanced by the hormone contained in the internal secretion of the pancreas, and we have a constant normal flow of sugar from the liver. When, however, the chromaffin system is for any reason overstimulated, as it may be through the sympathetic nervous system, there is an overproduction of the "accelerator" hormone of the adrenals; the "retarding" hormone of the internal secretion of the pancreas is more than counterbalanced, the glycogen in the liver is rapidly mobilized or set free, and a hyperglycemia and glycosuria result. A similar result occurs in the cases of so-called pancreatic diabetes. Here the adrenal hormone may be normal in amount, but owing to the pancreatic disturbance the pancreatic hormone is absent or diminished, and again the adrenal hormone is enabled to mobilize the glycogen of the liver.

5. A somewhat analogous explanation may subsequently be found to explain the glycosurias in pituitary and thyroid diseases.

6. The theory that hyperglycemia results from deficient consumption or oxidation of glucose in the tissues has fewer adherents than formerly. It may still be shown, however, that Cohnheim's theory is in part correct. At present the trend of opinion is in favor of the view that the hyperglycemia and glycosuria are dependent on overproduction of sugar in the liver as expressed under conclusion 4.

THE TREATMENT BY EMETINE OF AMEBIC DYSENTERY.

In the *Indian Medical Gazette* for November, 1912, ROGERS reports his results by this method.

One of Dr. Rogers's tables shows twenty-six consecutive cases treated in the same ward by his new plan of administering soluble salts of emetine hypodermically, or in a few of them by the mouth. They are classified in the same way as those in another table so as to be readily comparable. The first two patients were admitted in a

hopeless condition and died under three days, gangrene of the cecum being found in the first case post mortem, although an extraordinary improvement in the stools had taken place within forty-eight hours and no amebæ could be found remaining in the bowel wall after death, having apparently all been killed by the 3½ grains of emetine hydrochloride he had received during life. In the cases of the next two patients the dysenteric symptoms cleared up completely within two days under emetine, but one European female died of heat-stroke some days after being convalescent of her dysentery, and the other, a very anemic and dropsical subject, developed cancrum oris and died ten days after his dysentery was cured.

These two cases, then, are both remarkable examples of the rapid cure of dysentery by emetine in subjects who were so debilitated as to succumb shortly after to other diseases, and cannot fairly be treated as failures of the emetine treatment. All the remaining twenty-two cases have recovered—a remarkable testimony to the value of the new treatment, as they included a number of very severe and advanced cases, while no less than four of them showed a very high degree of leucocytosis, which has already been pointed out as being of most fatal import under the old methods of treatment. The only failures, therefore, have been in the two patients who were moribund on admission, while no case has been discharged "otherwise" at his own request while still uncured. As the emetine series also includes a fair number of chronic cases with dysentery of from one month to one year's duration, they are good samples of all types and stages of amebic colitis.

If we take the cases in which a cure was effected as judged by the final disappearance of blood and mucus from the stools, we find that the duration of the treatment with ipecacuanha varied between five and forty-four days, and averaged 11.4 days, during which periods from 140 to 1320 grains of the drug were taken, the average quantity being 406 grains. On the other hand, with the emetine treatment the stools finally became healthy in from one to four days, the average time being 2.3 days, while the quantity of emetine taken up to that time averaged 2 grains, and the total amount given while the patient remained in hospital averaged 5.03 grains. The stay in hospital of the ipecacuanha cases varied from seven to sixty days, the average being 16.4 days, while under emetine it lasted from five to eleven days and averaged 7.2 days, which included one day during which they were kept under observation before the specific treatment was begun, unless the condition was an urgent one. It is preferable to keep the patients in longer, but when the dysenteric symptoms regularly disappear completely in two to four days and solid diet then begun causes no relapse, it is very difficult to persuade them to stay. Rogers asserts he has had a number of them return to see him after an interval, and so far no true relapse of amebic disease has come to his notice.

One patient of the above series did return and die of dysentery, but after death the upper part of the large bowel showed extensive scars of healed amebic ulcers, while the lower half revealed an acute bacillary dysentery from which Shiga bacilli were cultivated. In a second similar case in another ward pneumonia was found post mortem, together with paralytic dilatation of the cecum and ascending colon, due to the extensive destruction of the muscular as well as the mucous coats, but only scars and no recent ulcers were present. Yet this man had only received three grains of emetine five weeks before his death, and he also had a small encysted liver abscess, free from both bacteria and amebæ, and evidently beginning to dry up. These two cases of apparent relapse only proved that the former amebic disease had been completely eradicated, and indicate that about three grains of emetine had really completely sterilized all the tissues of the body as far as the ameba is concerned. If further experience confirms these results the emetine salts will constitute the most remarkable therapeutic remedy yet discovered.

The occasional failure of hypodermic in-

jections of emetine salts in the case of very acute sloughing amebic dysentery dying within less than three days of admission led Rogers to consider the possibility of giving the salt intravenously. In a recent very severe case with great thickening of the cecum and local peritonitis, he gave a dose of half a grain of the hydrochloride dissolved in five cubic centimeters of normal saline injected very slowly into an arm vein, watching the pulse carefully, and found it did not depress it in the least. In the evening he gave two-thirds of a grain in the same way, and on the following day a full grain, in addition to subcutaneous injections, and at the time of writing the local symptoms had much improved, the passage of sloughs had ceased, while the amebæ disappeared from the stools within twenty-four hours of the first injection, and there is fair hope of his recovery. Whatever the ultimate result may be it is at least clear that very full doses of the drug may safely be injected intravenously, which is clearly the best plan in these desperate cases. There was no sickness or nausea after the last two large intravenous doses, but bilious vomiting both before and after the first one, so it is clear that the vomiting after ipecacuanha by the mouth is due to a local action on the stomach.

CLINICAL SIGNIFICANCE OF DIFFERENT FORMS OF REGULAR TACHYCARDIA.

In the *Lancet* of November 23, 1912, Lewis has this to say as to the management of tachycardia:

It is an impossible task to deal at all fully with the symptoms which tachycardia brings in its train, neither could one be made adequately conversant with the full rationale of prognosis and treatment in the present paper. Each would require a separate paper of its own. But that the importance of a thorough knowledge of tachycardia may be understood it may be expedient to outline quite briefly the reaction of these hearts to remedies employed.

When dealing with simple tachycardia, attention should no longer center upon the heart. The rapidly beating organ becomes simply an indicator; it tells you that somewhere in the body mechanism as a whole a screw is loose, and the search, though it does not avoid the heart, should be equally distributed. The discovery of an enlarged thyroid, signs of intoxication, an actual focus of infection, or instability of the nervous system, will bring us to our goal. It is not the intention of the author to teach us what remedies to employ or what counsel to give when acceleration of the heart is brought about through these agencies. But if, as will frequently be the case, the tachycardia is of the pathological order, then the further examination of the heart is the chief task. The patient may require help in three directions. He will wish to know his prospect; he will desire a remedy which will relieve or abolish the attack which is upon him at the time; and he will expect some guidance in the avoidance of future and similar crises. A knowledge of simple tachycardia will aid one but little in these respects.

The prognosis of pathological tachycardia will be twofold: it must concern the present attack and forecast the subsequent course of the patient. If one is certain that he is dealing with simple paroxysmal tachycardia, he can generally assure the subject of it that the attack will end within a few days, though patients sometimes succumb in attacks, yet the paroxysms when considered individually are rarely fatal. The fatal attacks are generally those in which the ventricular rate is highest and in which early signs of exhaustion manifest themselves.

The forecast of the future requires more consideration, and it may be well to delay it until one has had an opportunity of seeing the patient between attacks, and this is advisable in that the paroxysms often mask physical signs or are responsible for them. It is arrived at, first, by estimating the power of endurance of the heart muscle, an estimate which may take one far afield, but which should not omit a careful consideration of the symptoms in response to

effort, the size of the heart, and the presence of valve lesions. Secondly, we have to consider the frequency and duration of the attacks and the rate of the heart-beat during them. Lastly, the reaction of the heart to the paroxysm itself may be of great aid in the conclusions as to the burden which the organ can bear.

The immediate treatment of a simple paroxysm of tachycardia is usually expectant and symptomatic. A number of remedies are vaunted as successful for the severe attacks, but none are reliable in terminating a paroxysm. Lewis asserts he has observed attacks cease abruptly after the application of an ice-bag to the chest, or after the injection of digitalin or strophanthin; but more often these remedies fail. Rest, as absolute as possible, either sitting or lying, according to the patient's comfort; a restricted fluid and albuminous diet; the employment of bromides, chloral, or even opiates for the induction of the oft-needed sleep, are the most important indications.

The treatment of the malady as a whole is largely governed by the condition of the heart between the paroxysms. Close inquiry may reveal exciting causes of the attacks; sudden exertion or emotional disturbances may be the chief provocations of the crises; discontinuance of active employment may become imperative. Cleanliness of mouth and throat, orderliness of the dietary, the remedying of dyspeptic troubles and constipation may ward off the crises. Some patients are aided by the wearing of a tight abdominal belt.

The prognosis and treatment of auricular flutter should proceed upon similar lines, but there is one important addition. Flutter is a disorder which is much more liable to be long continued; as a general rule it has not the same spasmodic tendency. It is more serious, and once established may, by persisting for months or years, completely disable the subject of it for long periods. The ventricular rate is usually raised, lying between 130 and 170 per minute; the rate is then one-half the auricular. The administration of digitalis in full doses is often an invaluable remedy when such is the condition. A fall of ventricular rate as a result of an increased grade of heart-block may be almost confidently anticipated. No case, as far as Lewis knows, has yet failed to react in this fashion; and the lowering of ventricular rate promotes ventricular rest and alleviates the symptoms. Moreover, in a large percentage of cases, the drug abolishes the auricular acceleration, producing auricular fibrillation; and if the drug be withdrawn when this change of mechanism has been accomplished, the heart resumes, not the state of flutter, but a perfectly normal rhythm. As an accompaniment of these changes circulatory embarrassment speedily resolves itself, and a conspicuous improvement of the general condition is manifest.

FURUNCULOSIS AND THE RATIONAL TREATMENT.

KELLY in the *New Orleans Medical and Surgical Journal* for December, 1912, states his belief that the treatment of the furuncle itself depends on the stage of its formation. First, the stage of formation; secondly, the stage of ulceration and necrosis; and thirdly, the stage of resolution. When seen early in the stage of formation, the furuncle may be aborted in the following manner: Take a match and whittle to a fine point; dip into liquid carbolic acid, and shake off the excess; then bore the point of the match stick firmly and deeply into the middle of the furuncle and then withdraw it. By this process you have produced a white eschar, aseptic because the active bacteria have been destroyed. There is no pain, for it is relieved immediately by the anesthetic action of the phenol. When seen late, the common practice is to freely incise. Kelly does not think this is a good plan, for it has to go through its several stages of development, as the furuncle is a self-limiting process. It is only an assembly of leucocytes and serum waging war on the bacteria, and by incising you interfere with the defense that is being waged by nature, and you do not shorten the process, but tend to set back the work of nature and leave the

patient with a bad looking scar. Given a furuncle late in the first stage it seems to be the best practice to assist nature by establishing an outlet for the process of necrosis. This can readily be done by taking a short scalpel; lift off the central vesicle, exposing the hair follicle and the sebaceous gland. Authorities disagree as to the next procedure; some advise the use of the Bier cup to draw out the exhausted serum and blood, but Kelly asserts he is opposed to that, for it produces some traumatism, just as squeezing does, and as this condition is going on through to resolution, why interfere with nature?

He advises that the furuncle be dressed with a piece of plain sterile gauze wrung out of a normal saline with one-per-cent sodium citrate. The sodium chloride by osmosis sets up a flow of lymph through the walls of the furuncle and the citrate of sodium maintains a fluidity of the serum. He uses sodium citrate for two or three days. To prevent pustulation, he applies an ointment of oxide of zinc around the base of the furuncle. He also uses sodium citrate, grains 15, in a glass of water after each meal for its alkaline action on the blood and its diuretic effect on the kidneys. He also puts the patient on iron, quinine and strychnine as a general tonic. He continues the wet dressing of normal saline every four hours until the slough is loose, when he removes it with a pair of small dressing forceps; he then cleans this cavity with peroxide of hydrogen, and afterward applies dressings of plain sterile gauze, sometimes using aristol as an antiseptic drying powder.

THE MANAGEMENT OF GONORRHEAL RHEUMATISM.

HARTSOCK and ROBINSON in the *Journal of the Michigan State Medical Society* for December, 1912, reach these conclusions concerning antigonorrheal serum:

1. It must be used early and given in doses of at least from 4 to 10 Cc.

2. The serum should be given in at least three-day intervals.

3. As the preparation is not standardized, it must be tested out in each case.

In their clinic they have treated fourteen cases of gonorrheal rheumatism with thirteen cures, one case resulting in ankylosis and loss of function.

The conclusions put forth in this paper as to the relative value of vaccines and sera follow careful individual observation and trial of both remedies. It is hoped that their experience may call attention in the one case to the value of antigonococcus serum and in the other to the inefficacy of vaccines.

By courtesy of the Research Department of Parke, Davis & Co., the authors were enabled to follow certain investigations relative to the above paper.

TREATMENT OF ELECTRIC ACCIDENTS.

JELLINEK in the *Lancet* of November 23, 1912, insists on the importance of immediate resort to artificial respiration.

The mechanism of death does not appear to follow any fixed rule, as in poisoning by morphine or strychnine. Sometimes the victim does not regain consciousness; in other cases death follows from injury to the respiratory or heart centers, either singly or in combination, with or without unconsciousness.

Stoppage of the heart is the most dangerous symptom, but it is not right to say that the victim is dead merely because no positive evidence of heart action could be found. Cases have been observed after apparent death of returning consciousness, even to the extent of getting up and walking a few steps before the final collapse. So-called death from electric shock is only an apparent death in the first instance. Physiological death may follow rapidly if the shock has been of exceptional severity, or a few minutes or hours afterward if proper methods of resuscitation are not applied promptly. This is true whatever the voltage of the circuit or other circumstances attending the accident. It has been proved beyond contradiction that many lives have been lost

simply because first aid was not applied promptly. If artificial respiration could be applied instantly in severe electrical shock the proportion of deaths would be very small. This fact should be widely known and all electricians instructed in artificial respiration.

At present, in a severe accident of this kind those present tend to "lose their heads" or to run for assistance. "Sending for the doctor" is all very well if there is some one else to send, but if alone one's first duty is to apply artificial respiration at once and to keep at it until the victim shows signs of returning consciousness or other assistance arrives. Even going to the telephone to summon assistance might make all the difference between a life saved and lost. The freeing of the victim from entanglement or contact with the circuit may be very difficult and even dangerous to the rescuer if proper precautions are not observed, and the greatest difficulty is encountered when the victim has become entangled in a broken telegraph or telephone wire fallen across an overhead wire carrying a high tension current, such as is used for electric tramways. The victim might be pulled away by the clothes, rubber gloves being worn if available, or the rescuer might take off his own coat, insert his hands in the sleeves, and handle the victim in that way, if the voltage of the circuit was not above 800, but at 1000 volts this method begins to be dangerous for the rescuer; in all cases the coat must be dry. Having freed the victim, if respiration is not present, artificial respiration must be started at once, and continued, if necessary, for hours.

Admitting the advantages of the Schäfer method of artificial respiration, the Sylvester method is the better one for general use and instruction to workmen. A victim has been drowned by inhalation into the lungs of the contents of the stomach during the use of the Schäfer method. There is less likelihood of the liver and other internal organs being damaged by the forcible pressure used by workmen if not carefully regulated. On return to consciousness the patient must have absolute rest and quiet, even if his unconsciousness has lasted but a very short time. Under no circumstances should he be allowed to walk about or return to his work, or further loss of consciousness and other serious results might ensue.

The greatest number of electrical accidents happen to electricians from disregard for the ordinary rules of safety and from a familiarity that breeds contempt. Electricians should have periodical lectures, illustrated by pictures on the cinematograph, on the dangers of electricity, their origin and prevention; further, the elementary principles of electricity should be taught to the public, even to schoolchildren, so that they may have some idea of the risk attendant on every fitting connected with a source of public supply.

THE TREATMENT OF EPILEPSY.

ALEXANDER in the *British Medical Journal* of November 23, 1912, in a long paper on this topic has this to say of medicinal treatment:

A long experience of the treatment of epilepsy convinces him that we cannot depend entirely on hygienic treatment of the disease. A carefully arranged medicinal treatment will increase the number of arrests of the fits in a very material degree. Potassium bromide he never uses as a routine treatment. It is a very necessary and powerful agent for crises, and we could not well do without it; but if constantly used in the large doses commonly prescribed, there is no doubt of its baneful influence on the mind and brain. The routine medicine at Maghull, where such is considered necessary, is borax and sodium bromide. The maximum dose of each is 20 grains three times a day given in barley water. They have tested most of the compounds of bromide that have been recommended, and they do not find any to come up to the success of their own mixture, supplemented as it is by a normal healthy life.

As a general rule the only part of the colony treatment that is understood and that can be carried out in private practice is

the medicinal treatment. Relatives will attend to the distribution of medicine, but the other conditions, even when they are understood, which they often are not, cannot be carried out. And even the medicine, owing to many adverse influences, ceases to be given if the fits cease to occur. Again and again have private patients come back to Alexander after a long cessation of attacks, complaining that the fits had returned, and almost invariably he found that the administration of medicine had ceased or become so irregular as to be ineffective.

The operation of draining the cerebral edema or "fenestration of the dura mater" has been performed by him in a number of cases; these are recorded in the *Lancet* of September 30, 1911. It will be seen from a perusal of that paper that a large number of patients were benefited very much. The operation is undertaken in focal cases, and in such cases in which, as often happens, no tumor or gross lesion presents itself; he thinks the operation of fenestration should be performed wherever edema is present, and where from the absence of a lesion nothing else can be done.

His experience leads him to the conclusion that when the treatment of epilepsy is carried on as he has described above, the outlook of an epileptic will become much brighter and more hopeful than it has been in the past.

IODINE IN WHOOPING-COUGH.

CAVAZZANI (*La Pediatria,* February, 1912), after ten years' experience of the above mode of treatment, says that iodine is a valuable drug in the treatment of whooping-cough. The value of iodine in tuberculosis and in various infective diseases has been recognized by many authors, and the present author speaks highly of its use in typhoid. It is contraindicated in acute infections—for example, pneumonia, acute nephritis, measles, scarlatina, acute rheumatism, and influenza. In whooping-cough it is said to diminish the attacks of whooping, to shorten the disease, and make it generally milder. During the last ten years, the author says, he has seen no severe case such as he used to see before he began the iodine treatment. It does not act as a direct specific. He administers the drug as follows: He dissolves the metallic iodine in KI and water in the proportion of 1 part of iodine to 15 parts each of KI and water. Of this mixture he gives 4 to 6 drops per diem in sweetened milk to a child of one year, increasing up to 10 to 15 drops in children over five years. Given in this way, he has not observed any intolerance. It does not matter in what stage of the disease it is given. Apparently, in addition, he sometimes gives quinine or camphor monobromide.—*British Medical Journal,* Jan. 4, 1913.

THE THERAPEUTICS OF RADIUM.

The first report of Mr. Hayward Pinch, the medical superintendent of the Radium Institute, founded in London in 1911 at the suggestion of King Edward VII, and through the munificence of Sir Ernest Cassel and Viscount Iveagh, is an interesting and in many ways a remarkable document, for the opportunity of publishing which the *British Medical Journal* is indebted to Sir Frederick Treves, chairman of the Executive Committee of the Institute. It is remarkable, too, for the temperate spirit and scientific caution with which it is drawn up, and it is remarkable also for the striking benefit derived by certain patients in a distressing and hopeless condition from the treatment provided by the Institute. Too often those who have been concerned in the earliest application of a new method of treatment producing effects patent to any observer have been carried off their feet, and in the first flush of enthusiasm, generalizing from insufficient data, have made promises which later experience has not fulfilled. The report now published is free from that defect, and Mr. Pinch takes occasion to utter a warning against the irrational enthusiasm and unthinking expectation which has often attended the introduction of a new remedy and so led to cruel disappointment. He gives a rigid interpretation to the term "apparent cure," which is understood to be a condition in which all

trace of the original lesion or lesions has disappeared, in which there is no sign of any recurrence, and in which the patient is, so far as can be determined by a thorough and careful examination, free from any indication or symptom of the disease.

The report deals with the work of the Institute since it was opened in August, 1911, down to the end of last year, a period of a little over sixteen months. Owing to the generosity of the founders, the Institute is in possession of a very large stock of radium, so that practically any quantity considered advisable can be used in the treatment of any case, but Mr. Pinch makes it clear that great discretion must be exercised in determining the amount which should be used, the duration of application, and the amount of screening in any given case. All cases applying to the Institute have been received, except those practically moribund or those in which the disease was of a kind for which radium-therapy was manifestly unsuitable.

Probably most readers will look first at those passages in the report which deal with cancer. Any attempt to form an opinion with regard to them must be governed by the statement in the opening sentences of the report that no examples of malignant disease, with the single exception of rodent ulcer, have been treated unless operation has been declared to be unjustified or the patient has absolutely refused operation; the rigid interpretation given to the term "apparent cure" must also be noted. No useful purpose would be served by a minute analysis of the statistics, and Mr. Pinch does not attempt it. The stages and extent of the disease vary so much from case to case that only a very large number would warrant use of the statistical method, but some general impression may be obtained from a summary view of certain classes. It appears that the total number of patients suffering from epithelioma who applied for treatment at the Institute was 147; of these, 13 were not treated; in 8 the treatment was commenced so recently that no opinion on its results can be stated; and in 15 the application of radium was prophylactic only. This leaves 111 cases in which the treatment of epithelioma was undertaken, although it was abandoned by 23 patients. Of the 88 cases that remain if these be deducted, 20 are not improved and 22 are dead; if to them, on the assumption that the abandonment was due to the patients' disappointment with the result, we add the cases in which the treatment was abandoned, we get a total of 65 failures, or nearly three-fifths. To set off, we have 7 cases in which the patient was apparently cured and 39 in which there was improvement—a total of 46, or about two-fifths. Applying the same system of classification we find that in cancer of the breast the treatment failed in 38 cases and was attended with more or less success in 35, and that in cancer of the rectum it failed in 27 cases, or about three-fourths, and succeeded in 10, or rather over one-fourth. The report is quite definite in advising that radium should never be used in cancer of the breast as a substitute for operation, and the same is true of cancer of the rectum. It seems established, however, that in inoperable cases of cancer of the breast, radium is often able to relieve pain, promote the healing of ulcers, and check the growth of secondary deposits; in a few instances superficial carcinomatous nodules and enlarged glands disappeared, and reports are given of several such cases in which the results were very remarkable.

In cancer of the uterus the immediate results reported are so satisfactory that it would appear well worth while to submit any patient with inoperable disease to the radium treatment. It has been applied by introducing into the cervical canal a tube containing radium for periods of thirty to sixty hours spread over five or ten days. In a considerable proportion of cases hemorrhage is arrested, discharge diminished and rendered inoffensive, ulceration healed, pain relieved, and the growth even in some cases stopped. Out of 39 cases treated 3 were apparently cured, while 19 were improved; but the report points out that the action is only local, that in most cases dissemination will occur, and the growth

spread to parts beyond the effective range of radium.

The evidence as to rodent ulcer seems to justify the conclusion that the best advice which can be given to a patient with rodent ulcer of the skin is to resort at once to treatment by radium. It has been found that if the lesion has been treated for prolonged periods by the *x*-rays, zinc ionization, and carbonic acid snow, the healed tissue frequently breaks down after radium, and repair is slow and imperfect. A small rodent ulcer limited to the skin and not previously treated may be cured by a single exposure, probably because it is safe to use a full-strength applicator unscreened. With a large ulcer it is necessary to proceed more cautiously, as an unscreened application to the whole area will produce severe systemic disturbance. Different parts of the surface are therefore treated at intervals of three or four weeks. If the disease has attacked bone or cartilage, still more caution is requisite to avoid the risk of acute painful and prolonged inflammation. Rodent ulcer of a mucous membrane is refractory to treatment by radium, though small lesions of the palpebral mucous membrane often respond well to a strong unscreened application. The statistics are encouraging. Omitting one case in which the application was prophylactic only and 10 treated so recently that the result cannot be stated, there remain 90 cases. Of these, 12 were not improved, 6 abandoned treatment, 31 were apparently cured, and 41 improved. If we assume that treatment was abandoned owing to its want of success, it will be seen that the treatment failed in one-fifth of the cases, succeeded in about one-third, and produced improvement in the remainder. It will be noted that all the patients who applied to the Institute were treated. The cases of sarcoma are relatively few; 26 were treated, of whom 9, or about one-third, were improved, it being said of two of them that they are apparently cured.

Among the other diseases treated the most striking results were obtained in keloid and nevus. In the former disorder they are described in the report as "admirable," and whether judged by the statistics or by the individual cases narrated the epithet seems to involve no exaggeration.

Of the 14 cases of keloid or keloid acne treated, 3 are reported cured and 8 improved, while the treatment was abandoned in the remaining 3. One of the chief practical difficulties in the therapeutic application of radium is so to adjust the strength and duration of the application as to avoid a severe reaction. The cause and nature of the reaction has not yet been fully elucidated. Why it should commonly be delayed for two, three, or even four weeks, is not at all clear, and we are not aware that any explanation has been suggested. In some cases in which an eroded surface exists the radium reaction proper is, there can be little doubt, complicated and aggravated by septic infection, and it would seem that in some such cases the severe pain suffered during the reaction is in part, at least, due to this cause.

They are indebted to Prof. E. Rutherford, F.R.S., of Manchester, for the information that in his laboratory a number of cases have occurred in which fingers have been burnt by exposure to the alpha-rays. This has usually occurred in transference of the emanation or in fixing an alpha-ray tube in an apparatus when the fingers were brought into close contact with the tube. As a rule nothing is noticed at the time, but a week or ten days later the finger becomes very painful, and a slight bluish tinge is observed under the skin. The general effect later is that the finger has lost to a great extent its sensitiveness of touch, but there have been no cases of sores which would not heal. These particulars are an interesting addition to the information given in the brief reference to the subject in his Radioactive Substances and Their Radiation, a book to which we confidently refer all serious students of the subject.

The treatment at present is in the empirical stage. To get an institution of this novel kind into working order and to evolve and test rules for its administration has been no easy task. Now that it has been

accomplished we may look forward to the prosecution of inquiries into the physiological action of radium, for on the perfecting of knowledge on this side the establishment of principles governing the scientific use of the radiations in therapeutics must depend. A question of vital importance is to ascertain whether the rays of radium exert a specific action on cancerous or developing tissue. At present it is not clear which rays produce the effects observed in carcinoma. So far as can be judged it is improbable that the alpha-rays, under the conditions described, can as a rule have reached the tissues. Whether the most penetrating rays —the gamma-rays—have any physiological effect is not known with any certainty, but the evidence seems, on the whole, against such a hypothesis. There remain, therefore, the beta-rays, which are themselves complex. An analytic study of the physiological effects of the several groups of rays would be a worthy object for the Radium Institute with its unrivaled resources and magnificent opportunities.—*British Medical Journal,* Jan. 25, 1913.

RAIN-BEARING WINDS AND TUBERCULOSIS.

GORDON in the *Practitioner* for February, 1913, contributes an interesting paper on this topic and reaches these conclusions:

He imagines it will be held by those who have carefully followed this evidence, particularly if they have referred to the original publications, that the following conclusions are inevitable:

Proved.	*Probable.*
That populations exposed to strong, prevalent, rain-bearing winds tend to suffer *considerably* more from pulmonary tuberculosis than populations sheltered from them.	That exposure to strong, prevalent, rain-bearing winds tends to: i. Affect appreciably the course of existing cases of phthisis; ii. Affect considerably the prevalence of bovine tuberculosis; and iii. Affect somewhat the prevalence of other forms of human tuberculosis besides pulmonary.

Hence naturally follow these practical deductions:

A.—It is *imperative,* in choosing a place of residence for cured cases of pulmonary tuberculosis or for persons of pronounced tubercular family history, to take into account its wind-exposures.

B.—It is *imperative,* in investigating any influence bearing on the prevalence of pulmonary tuberculosis and possibly of other forms of tuberculosis, first to recognize and eliminate the influence of strong, prevalent, rain-bearing winds.

C.—It will be *wise,* in choosing a site for a tuberculosis sanatorium, to take the local wind-exposures carefully into account.

D.—It will be *wise,* in examining farms for cases of bovine tuberculosis, to examine particularly those which are fully exposed to these winds.

ON THE "CONTROLLED" THERAPEUTIC USE OF NEW TUBERCULIN IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

In the *British Medical Journal* of February 1, 1913, RIGG gives the following summary of his results:

1. Physical signs: (*a*) Tuberculin-treated patients—out of 10: improved 1, worse 4, *in statu quo* 5. (*b*) Non-tuberculin-treated patients—out of 9: improved 4, worse 3, *in statu quo* 2.

2. Increase of weight: (*a*) Tuberculinized patients (10 cases): gained 10 to 20 pounds, 4; gained less than 10 pounds, 4; *in statu quo,* 2. (*b*) Non-tuberculinized patients (9 cases): gained over 20 pounds, 2; gained 10 to 20 pounds, 3; gained less than 10 pounds, 4.

In (*a*): average per cent of increase of weight, 6.3.

In (*b*): average per cent of increase of weight, 10.3.

3. Exercise—capacity of walking, maximum amount per diem: (*a*) Tuberculin patients (10 cases): two miles and over, 3; 1 to 2 miles, 5; less than 1 mile, 2. (*b*) Non-tuberculin patients (9 cases): two miles and over, 6; 1 to 2 miles, 3; less than 1 mile, 0.

4. *General Condition.*—This is a difficult criterion, but, generally speaking, in (*a*) only 5 out of 10 were in thoroughly good

condition; in (*b*) 8 out of 9 were in thoroughly good condition.

The net result of these observations is to show that the administration of new tuberculin by one of the more popular approved methods is not followed by greater improvement in the physical signs, nor by greater increase in weight, nor by more greatly increased capacity for physical work, nor by a greater improvement in the general condition, as compared with the results of ordinary hospital methods.

The observations on the signs do not support the idea that new tuberculin in any way lessens the activity of the local lesion. It is possible that the less favorable influence on weight, the less capacity for work, and the falling off of the general condition are due to the disabilities imposed on the patient by being treated with tuberculin, as they so often were kept in bed to help restore the temperature to normal.

ECZEMA AS SEEN BY THE GENERAL PRACTITIONER.

RAVOGLI in the *Lancet-Clinic* of February 8, 1913, has this to say as to treatment:

The general practitioner must relinquish the false idea or superstition that the washing and cleansing of an eczematous surface is injurious. Occasionally patients come to consult Ravogli with eczema, dirty, with thick crusts. They excuse themselves by saying that the doctor had forbidden them to wash and to use water in any way. Eczematous surfaces have to be cleansed and kept aseptic, as well as possible, just like any other inflamed or suppurating surface. The purulent secretion remaining on the excoriated surface of the skin is exceedingly irritating and causes the eczema to become more angry and to spread to the contiguous skin.

Internal specific treatment for eczema does not exist. The patient has to be studied concerning his gastrointestinal functions and his general nutrition. If the patient is a dyspeptic, his stomach has to be helped with alkaline mineral waters or with antidyspeptic remedies. If he should suffer with constipation, his condition has to be relieved by administering saline waters, purgatives, etc. When the general nutrition is poor, good meat and ferruginous preparations are the base of the treatment.

The recent introduction of the staphylococcic vaccine treatment, although greatly praised, has given in Ravogli's hands no results, and he cannot conscientiously recommend this treatment for eczema.

The local external treatment is the key to success. Acute eczema has to be treated like any other dermatitis—applications of aluminum subacetate, 2-per-cent solution, and dusting the surface with amylum powder. For vesicular eczema, liniments with carbonate of zinc, or with ichthyol, are very beneficial. In recurrent vesicular eczema painting the surface with tincture of iodine, as is done to sterilize the skin in surgical operations, and then covering with an oxide of zinc paste, has given very good results. Rhagades must be touched up with nitrate of silver, from 3 to 5 per cent, to bring them to recovery.

An innumerable quantity of ointments, salves, gelatins, and lotions are given in the text-books. The physician, however, has to familiarize himself with the different preparations and with their action in order to accomplish a cure in a case of eczema.

PITUITARY EXTRACT AS AN ECBOLIC.

DOLLERT in the *Atlanta Journal-Record of Medicine* for January, 1913, says there is probably no time in the routine experience of the general practitioner when greater anxiety is felt for the action of remedial agents than that period during labor, when the life of the mother and child is endangered from hemorrhage or delayed labor resulting from uterine inertia.

While the physicians have placed more or less confidence in the use of ergot or large doses of quinine to carry them safely past the danger mark, neither agent can be relied upon in every case, and even at best the results are frequently delayed to the point of greatest danger.

In casting about for an agent to fulfil

this long-felt want, Dollert was attracted by the reports upon pituitrin. According to the results of clinical and laboratory investigation, this preparation approaches the ideal as an ecbolic. After using pituitrin in obstetrical practice, for both hospital and private work, covering a period of almost two years, he is fully convinced that it is the best and most reliable ecbolic known at the present time. Its action is superior to and of much longer duration than either ergot or quinine sulphate, for even if the latter is given in large doses it frequently fails to produce any perceptible contraction.

He has used pituitrin not only to induce labor, but during the natural progress to increase the power of contraction. He has also given it after the termination of labor in cases of hemorrhage or where there is a tendency or possibility of hemorrhage. To induce labor 1 to 2 Cc. (16 to 32 minims) is given subcutaneously, which is usually sufficient to produce the desired effect. During labor, if the pains become weak and irregular, 1 Cc. (16 minims) given hypodermically usually stimulates powerful contraction, which is apparently normal in every respect.

After the first stage of labor, if the uterus is soft and there is considerable oozing of blood an injection of 1 Cc. of pituitrin will cause prompt contraction of the uterus and cessation of bleeding. In cases of postpartum hemorrhage its use as above stated will keep the uterus contracted, thereby controlling hemorrhage, and have a general stimulating effect upon the patient.

INTESTINAL MOVEMENTS UNDER THE INFLUENCE OF APERIENTS.

F. Meyer-Betz and T. Gebhart have published in considerable detail the results of their investigations of the intestinal movements under the influence of various purgatives and aperients in healthy persons by means of *x*-ray illumination (*Münch. med. Woch.*, Aug. 13 and 20, 1912). They state that this work could scarcely have been carried out without the excellent observations of Magnus and Padtberg on the cat having preceded it. It is impossible in a short abstract to give the data which form the subject of the communication, but the reader who is interested in the same will be well advised to refer to the original article.

After describing the method of procedure, they give an account of typical experiments usually conducted on young patients whose digestive apparatus were natural. They divide these into four classes. In the first they deal with senna and aloes. The stomach and small intestine are not affected by these drugs. The action, limited to the large intestine, is not a stormy one, but consists of a combination of increased peristalsis with what has been termed by Schwarz as "small movements of the colon." The contents are well intermixed and the passage through the colon into the sigmoid flexure and rectum is a rapid one. Variations and minor points in the action of these two purgatives are both described in the text and illustrated by diagrams.

In the next class castor oil is dealt with. In this case, although vomiting was at times noticed, no increased peristalsis of the stomach could be detected. The action on the small intestine is best marked when the oil reaches the already full gut, and in the course of from three to four hours causes the whole contents to be thrown into the colon. The movements in the small intestine are partly rolling peristaltic movements and partly rhythmical segmentative movements. The mass reaching the colon remains practically fluid, and the normal real cecum movements are not observed. The haustra are not well marked and the intestine is filled with gas, probably from secretion. No "small colon movement" is present, and the discharge of the mass into the sigmoid and rectum takes place suddenly as the result of increased outward peristalsis.

The third group of purgatives, that of the drastics, is represented by jalap. The results obtained correspond to a great extent with Padtberg's colocynth experiments. The increased secretion in the small intes-

tine leads to a complete filling of the gut. In about three hours the contents of the small intestine is discharged. The normal cecum activity is absent, and the rapid passage through the large intestine of the fluid motion is characterized by repeated filling and sudden emptying of the ampulla.

The fourth group is that of the salines. In this case the marked watery secretion of the intestine leads to an almost uniform passage of the fluid motion throughout the whole intestinal tract. The action is similar to that of jalap.

The authors further have investigated the action of calomel. This drug stimulates every segment of the intestine. In the small intestine rolling movements are produced, and while the secretion is not increased, the peristalsis often becomes stormy. This is best seen in the large intestine. They find that calomel is endowed with the power of emptying the intestines better than any other drug, and state that if it were not for the danger of an undesired absorption of the poison it would be the best and most searching purgative that we possess.—*British Medical Journal,* Jan. 25, 1913.

TREATMENT OF TETANUS BY INTRADURAL INJECTIONS OF MAGNESIUM SULPHATE.

THEODOR KOCHER (*Correspondenzblatt für Schweizer Aerzte,* Sept. 10, 1912) has successfully employed a modification of Meltzer's method in the treatment of tetanus. A carter, aged fifty-six, was seen on November 29. A fortnight previously, during stable work, he cut his left thumb. The wound was cleansed and sutured on the following morning. Eight days after the accident the wound had suppurated, and the sutures were removed. On November 27 trismus appeared. This was followed by lumbar pain and rigidity, which spread to the shoulders, arms, and legs. On admission to hospital there were marked opisthotonos, dysphagia, and profuse sweating. The temperature and pulse were normal. The wound was cleansed and painted with iodine. Ten cubic centimeters of tetanus antitoxin was injected hypodermically near the wound, and toward night a similar amount was injected intravenously. Two hypodermic injections of 2-per-cent carbolic acid (Baccelli's method) were also given. But, in spite of treatment, the tonic spasms increased, and the face became cyanosed. On November 30, at noon, 2 Cc. of a 25-per-cent solution of magnesium sulphate was injected into the lumbar subarachnoid space. The muscular rigidity soon decreased. In the evening a second subarachnoid injection of magnesium sulphate and a third injection of 10 Cc. of tetanus antitoxin were administered; 500 Cc. of sterilized water was injected subcutaneously. On December 1 the rigidity was less, but spontaneous micturition was impossible. An intradural injection of 3 Cc. of a 25-per-cent magnesium sulphate solution, and also hypodermic injections of morphine and carbolic acid, were given. On December 2 micturition was normal. Injections of carbolic acid and chloral were given. On December 4 the rigidity again became marked, and 5 Cc. of the magnesium sulphate solution was again injected. Fifteen minutes later the rigidity decreased, first in the legs, then, in order, in the abdomen and arms. An hour later the patient could sit up, and soon the muscles were fully relaxed. Later in the day some rigidity recurred. On December 5, on the increase of rigidity, 5 Cc. of the magnesium solution was injected. The rigidity decreased within half an hour. The treatment was repeated with the same good result on December 6 and 7. On December 8 four doses of 15 grains of calcium chloride were given. On December 14 the muscular rigidity had almost disappeared, but there was again retention of urine with suppression of the patellar reflexes. The patient was discharged cured on the thirtieth day after admission to hospital.

In two further cases of tetanus with severe attacks of tonic spasm and opisthotonos, which occurred as often as twenty times in fifteen minutes, intradural injections of magnesium sulphate were equally successful in combating the muscular

spasms; recovery followed in both cases. In the first of these cases after the seventh injection of 5 Cc. of the magnesium sulphate solution unconsciousness supervened and respiration ceased. Tracheotomy was performed, a cannula was introduced nearly as far as the bifurcation of the trachea, and oxygen was insufflated. Sufficient space existed between the walls of the cannula and trachea for the exit of the gas or air. The cyanosis subsided, but the respirations remained at two or three in the minute during an hour. Consciousness was recovered twenty-four hours later. Tetanus antitoxin was also employed.

This method of treatment is based on the researches of Meltzer and Auer, who found that magnesium sulphate and chloride when injected subcutaneously in the proportion of 1.5 grammes per kilo of body weight produce deep sleep with muscular relaxation and abolition of all reflexes except the conjunctival and trigeminal. Doses exceeding 2 grammes per kilo are followed by arrest of respiration, the heart continuing to beat for a time and the blood-pressure being maintained. Hence resuscitation is possible by artificial respiration, providing O'Dwyer's apparatus for intralaryngeal insufflation under pressure is used. Local applications of 25-per-cent magnesium sulphate solution to nerve trunks produce complete nerve block, both conductivity and excitability being suppressed. Sensory nerves are more rapidly affected than motor.

Mathews and Brooks conclude that magnesium salts, like curare, paralyze the motor nerve endings before the respiratory center. However this may be, physostigmine, which is physiologically antagonistic to curare, is also antagonistic to magnesium, and invariably stimulates the respiratory center. If respiratory paralysis is threatened, the danger may be rapidly removed by Arnd's method of washing out the lumbar sac with sterile normal saline solution; the only disadvantage is temporary paralysis of the bladder. The position of the patient at the time of and after the injection is of great importance. The action of the magnesium is at first local. Hence, if the body is raised almost vertically and the neck is flexed, the evil effects on the respiratory center may be avoided. But if the upper part of the body is involved, and especially in cephalic tetanus, it is desirable to extend the action of the salt to the medulla oblongata. For this purpose the legs may be raised above the body for a time. This was done in the writer's third case for two hours after an injection, with the result that two hours' profound sleep in complete muscular relaxation resulted. Kocher believes the strength of the solution recommended by Meltzer to be unnecessarily strong. Fifteen per cent proved ample. Of this solution as much as 10 Cc. may be safely injected. Two injections may be given daily, though owing to a cumulative action not at too short intervals. Thus two doses of respectively 7 and 10 Cc. were given within five hours. Deep sleep, from which the patient could not be awakened, and stertorous breathing resulted. If the urgency of the symptoms rapidly necessitates a second dose, the amount injected should be reduced by half.

ANTITOXIN ADMINISTRATION.

In the *Boston Medical and Surgical Journal* of January 16, 1913, PARK writes on the advantages of the single injection in all cases, and of the intravenous method in bad cases.

These are the two things which Park wants to emphasize as possibly tending to a better treatment. The giving of larger doses than are necessary does no harm, except the expense to the city or patient; but an insufficient first dose, and in suitable cases the fact of not giving it intravenously, may be a serious mistake.

There is a great advantage in giving all in one injection, instead of in two to four injections. Two goats were used, one receiving 15,000 units subcutaneously in one injection, and the other four doses of 5000 units each at intervals of eight hours. At the end of eighteen hours we have 12 units in each cubic centimeter of the blood in the goat receiving 15,000 units, and have only

3½ units in the one receiving the divided doses, because only the first portion has had any possibility of being absorbed. It is only at the end of the third day that 20,000 units in divided doses equals in effect the single dose of 15,000 units; and during the first day we have but one-third the effect. Park's opinion is that we should give in the first dose all that we think is required for the entire disease; and if we find it necessary to give a second dose, we have misjudged the amount necessary. He is certain that much of the good effect believed to be due to the second and third doses has been due to the fact of the further absorption of the first dose. As already stated, they are practically eliminating at the Willard Parker Hospital in New York the second dose, and the results seem as good as at Kingston Avenue Hospital, where the same size initial dose is repeated in later doses. It should be borne in mind that a thousand times as much antitoxin as is required for the amount of toxin in a case is given. The great excess is for the purpose of pushing it out into the tissue fluids of the diseased parts and wherever toxin may have passed.

Before closing, he writes of the intravenous injection, and urges it not only in cases of malignant diphtheria but in all cases of tetanus. The difference, during the first day, in the amount of antitoxin in the blood when injected intravenously and when injected subcutaneously is very great. At the end of six hours one has, with a suitable amount by the subcutaneous method, two units, and by the intravenous method 20 units in each cubic centimeter. As the hours pass, the one diminishes and the other increases; but even at the end of twenty-four hours we have 12 units against 6 units. He feels certain that 5000 units given intravenously has as much effect as 20,000 given subcutaneously. Intravenous injections of refined antitoxin have been made by them in nearly 200 cases and have given no bad results. They have given a large number of children and adults other serums, intravenously, in large amounts, and in all their experience they have had only one patient who showed bad symptoms. In little children one must cut down on the vein, but with adults and larger children it is a very simple method. The serum must always be warmed to blood-heat before injecting. Park thinks that in all cases of septic diphtheria one should give a dose intravenously, but in mild and early cases it is sufficient to give it subcutaneously. Intramuscular injections are absorbed in about one-half of the time required by the subcutaneous ones, when the serum stays in the muscle substance; but in practice it often escapes.

In tetanus he has frequently seen the life-saving action of the intravenous injection. He believes it is almost criminal negligence not to give an intravenous injection at the first moment possible. Consider a case of tetanus in which, by the symptoms, we know the most important cells of the body are already affected; is it not foolishness to rely on a subcutaneous injection with its slow absorption? Park has urged the surgeons in New York to keep antitoxin on hand, and at the very first sign of tetanus to inject intravenously about 20,000 units of antitoxin. If only a smaller amount is available, that should be injected immediately and a larger amount later. Time is more important than quantity. In those cases of continuing rigidity Park admits he advises to go on giving smaller injections every twelve hours for several days, but the more he tests the blood in these cases, the more doubtful he is as to the value of repeating the injections. At intervals of twenty-four hours they keep up the strength of antitoxin. He is sure that a large intravenous injection given within a few hours of the onset of symptoms will save a considerable percentage of patients who would otherwise die. The usual practice after first seeing the patient is to wait twelve hours in order to be certain of the diagnosis, and then to call at the laboratory to get antitoxin; thus from twelve to eighteen hours are wasted. We know that many animals treated within a few hours after the injection of tetanus toxin intravenously by large doses of antitoxin are saved, and our experience at the bedside

has proved the wisdom of large initial doses. Let us, therefore, combine laboratory results with bedside observations.

COCAINE POISONING.

Bose in the *British Medical Journal* of January 4, 1913, discusses this subject. He points out that the medicinal dose of the hydrochlorate of cocaine is 1/5 to ½ grain. The minimum fatal quantities on record are 2/3 grain hypodermically, 12 to 15 grains by the mouth, and 22 grains by rectal injection.

A few cases have been recorded in European practice in which the drug either proved fatal or produced very severe symptoms when it was injected hypodermically or passed into the natural cavities prior to a surgical operation, or administered internally. In one case the injection of 3½ grains into the breast of an adult woman was immediately followed by epileptiform convulsions, and in twenty minutes by death. In another instance the hypodermic use of 2/3 grain in a woman, aged seventy-one, proved fatal in five hours. In the *Pharmaceutical Journal,* 1886 (iii, 16, 721), a case is recorded in which the hypodermic injection of 1/20 grain caused dangerous symptoms in a girl aged twelve years. On November 2, 1895, a case was reported in the *Lancet,* in which 2 drachms of a 10-per-cent solution of cocaine (representing 12 grains of the drug) taken internally for the relief of a toothache caused death in twenty minutes, with epileptiform convulsions. In another case 1/100 grain applied locally to the conjunctiva gave rise to dangerous symptoms; while in still another instance acute manifestations followed the injection of half a drachm of a 10-per-cent solution —that is, 3 grains—into the urethra. A rectal injection of 22 grains of cocaine has been productive of death.

The prominent symptoms in all these acute cases of poisoning consisted of dryness and numbness of the mouth and throat, vertigo, dyspnea, failure of the special senses of sight, hearing, and smell; numbness of the extremities; rapid and feeble, sometimes irregular or intermittent pulse; muscular tremors, a staggering gait, dilated pupils; epileptiform, sometimes tetanoid convulsions; cyanosis, and insensibility.

The practical lesson to be learned from cases like these is the extreme care which is necessary in administering the drug for the production of local anesthesia in dental practice and surgical cases.

No case has yet been recorded in Indian medical practice, so far as Bose has been able to ascertain, of acute cocaine poisoning with a fatal result. In the twenty-seven years during which he has been connected with the Chemical Examiner's Department in Bengal, he has not had a single case of fatal cocaine poisoning referred to him, except three, all of which occurred within the past six months. Not only does this fact appear to indicate that the drug is very easily procurable by the common people, in spite of the strict regulations against it, but it also seems reasonable to infer that the people are getting to be more familiar with the uses to which the substance can be put.

EXPLANATION OF MANY OF THE CASES OF WEAK OR PAINFUL BACK, AS WELL AS OF LEG PARALYSIS.

Goldthwait, in the *Boston Medical and Surgical Journal* of January 23, 1913, says that as to the simple sacroiliac strains or displacements there is no need of repeating what has already been written, but if the sacroiliac joint is involved as part of a lumbosacral malformation it is obvious that treatment directed to the sacroiliac joint alone will not bring relief. In such a case not only must the sacroiliac joint be supported, but at the same time the body must be so poised that there is the least possible irritation at the lumbosacral joint, as well as the least possible pressure of the transverse process against the sacrum and ilium. To relieve this pressure of the transverse process, since it is increased by drooping the body and increasing the normal lordosis, it will be lessened by anything that holds the body fully erect or which flattens the back. For this reason pain in the lumbo-

sacral or lumbosacral transverse articulation is usually relieved by simple recumbency upon the back, although a sacroiliac joint pain may be increased by this same position.

If the condition is purely a lumbosacral lesion, naturally the most important element in the treatment consists in so changing the poise of the body that there will be the least unnatural pressure at the joint. Usually the anatomic peculiarity, if present, has existed since birth, and the symptoms have come on late in life simply because of undesirable postures, which have been acquired. Recognizing this, it is usually possible to relieve the symptoms, although the potential of trouble remains, to become active again in case of accident or careless habits of carriage. With the sacroiliac joint lesions naturally the elements of poise are equally important, but unless other elements are present the permanence of the improvement is more certain.

PERFORATED DUODENAL ULCER.

STRUTHERS (*Edinburgh Medical Journal,* December, 1912) concludes a clinical paper on this subject based on 27 cases referred to him as follows:

Duodenal ulcer may be present and go on to perforation without giving rise to characteristic symptoms before perforation.

There are no symptoms which may justly be described as premonitory of perforation.

When perforation of a duodenal ulcer has occurred, difficulty in diagnosis may arise owing to (*a*) the pain being referred to the appendix region; (*b*) early and marked abatement of the severity of symptoms in cases in which leakage from the perforation is limited by early adhesion taking place, or by edematous swelling of the intestinal wall in cases of very minute perforation.

Catgut may safely be used to close and infold the perforated ulcer, and is preferable to silk for this purpose.

Gastroenterostomy should be done at the operation for closing a perforated ulcer when the patient's condition will permit of it, for it promotes the immediate recovery and lessens or abolishes the tendency to recurrence of ulceration.

SALINE INJECTIONS IN TOXIC SKIN DISEASES OF PREGNANCY.

RISSMANN (*Deut. med. Woch.,* June 3, 1912, quoted in the *St. Paul Medical Journal,* January, 1913) was led in September, 1911, to use Ringer's saline solution instead of serum, which was not obtainable at that time, in a severe case of pruritus in a pregnant woman. The marked improvement which followed an intramuscular injection of 165 Cc. of this solution induced him to repeat the experiment in several other cases, the results being strikingly beneficial. In the case of a woman aged thirty-four, who suffered from severe general pruritus toward the close of her first pregnancy, the skin over the abdomen was reddened, thickened, and edematous. Treatment with ointments was unavailing and sleep was disturbed. The intramuscular injection of 160 Cc. of Ringer's solution was followed in a few hours by marked improvement, and a peaceful night was passed. The pruritus improved daily, and it had disappeared four days later when labor began. The recovery was maintained throughout the puerperium.

In another case pruritus involving the arms appeared in a woman, aged twenty-three, whose first confinement was terminated a day earlier. The pruritus spread in the course of a day to the lower limbs. The forearms and lower limbs were covered with small wheals and sleep was much disturbed. The itching ceased and sleep returned after an injection of 190 Cc. of Ringer's solution.

Another pregnant woman had been treated in vain during the latter months of her first pregnancy for intolerable itching, which had evidently at first been mistaken for scabies. Abrasions due to scratching covered the whole body. An injection of 175 Cc. of Ringer's solution was followed by the first peaceful night which the patient had spent for several weeks. On the fol-

lowing day the itching had almost ceased, but as it still caused some discomfort four days later, a second injection was given, after which an uneventful recovery was made.

The injections were supplemented by no other form of treatment, and as no ill effects ensued, even when out-patients were thus treated, Rissmann advocated their adoption in general practice. In severe cases it is necessary to repeat the injections, and care should be taken to exclude such cases as are the results of parasites of the skin. The operation is simple, and only requires a funnel, tubing, and a hollow needle. It is therefore much simpler than the procedure devised by Bruck, who has obtained strikingly good results in cases of universal and senile pruritus, urticaria papulosa, and erythema exudativum multiforme by venesection, followed by the intravenous injection of saline solution.

The author attributes the beneficial results obtained by his method to the dilution of toxins circulating in the blood and to the increased diuresis which follows the injections. The nature of toxins causing cutaneous eruptions in pregnancy is still obscure, and it is uncertain whether they are due to products of faulty metabolism or to microbes flourishing in the tissues. The author suggests that the injections may also affect the composition of the blood by stimulating the blood-forming organs. He is skeptical as to the prevalent notion that the vomiting of pregnancy is a toxic phenomenon, but he admits that injections of Ringer's solution might stave off severe organic disease in the vomiting of pregnancy which is associated with a dull headache and slight renal disease.

ANESTHETIZING THE BRACHIAL PLEXUS.

KULENKAMPFF (*Beitr. z. klin. Chirurg.*, Bd. lxxix, Heft 3) describes in detail the method adopted in Braun's clinic for producing analgesia in the distribution of the brachial plexus. In doing so he emphasizes the fact that it requires no very special knowledge to carry it out. With a little practice and attention to detail any one may get satisfactory results. The solution used is a 2-per-cent novocaine in saline, with 3 or 4 drops of a 1:1000 solution of suprarenin added to each ounce of novocaine solution made up. Of this 20 Cc. are injected. The syringe used should be fitted with an easily adapted needle 6 centimeters (2¼ inches) long.

In making the injection it is well to place the patient sitting upright on a chair, with a good support for the head, as the palpation of the parts and the direction of the needle can be better controlled in this position. The pulsating subclavian artery is first palpated above the clavicle and a cutaneous wheal of novocaine made immediately outside this—*i.e.*, just above the middle of the clavicle. Light backward and inward pressure on this wheal reveals the resistance imparted by the first rib, and the cords of the plexus can often be felt on the rib under the finger. The needle is then entered through the wheal in the skin and pushed on toward the nerve cords as they lie on the rib. When the needle strikes one of the nerves a tingling sensation is felt in its distribution, and the syringe should then be carefully attached and the injection made. Twenty cubic centimeters should be injected and distributed directly in or on the nerves if success is to be obtained. If the cords are missed, as indicated by the absence of any radiating twinge as the needle travels, the needle should be gently and slightly moved backward and forward till a nerve is struck, for if injection is made without definite knowledge that it is in the right place, failure to produce analgesia is almost certain.

When the solution has been properly distributed, analgesia of the upper limb, up to a handbreadth above the elbow, follows in about eight to ten minutes and lasts one and a half to two hours. It is often accompanied by motor paralysis, complete or partial.

The results obtained in the first 100 cases in which the method was tried showed 77 successes, 4 complete failures, and 19 cases

in which analgesia was not complete but sufficed for the performance of the operations done, except in a few cases in which a little ether was given to finish the operations. It should be noted that these results were obtained without the use of general sedatives, such as morphine, scopolamine, etc.—*Edinburgh Medical Journal,* December, 1912.

DEVELOPMENTAL ADHESIONS AFFECTING THE LOWER END OF THE ILEUM AND COLON.

Gray and Anderson (quoted in *Edinburgh Medical Journal,* December, 1912) discuss under this title the conditions variously termed (1) Lane's terminal ileal kink, described by Arbuthnot Lane, and regarded by him as an important feature of the conditions associated with intestinal stasis in its varied manifestations; (2) Jackson's membrane, the thin vascularized peritoneal membrane often found crossing the ascending colon, and binding down and kinking that portion of the intestine more or less firmly; (3) splenic kink or Payr's disease, due to a short phrenicocolic ligament, with adhesion between the transverse and descending colon; (4) lower sigmoid or mesosigmoid adhesions in the form of bands fixing the sigmoid or mesosigmoid to the left iliac fossa.

Gray and Anderson believe that all these conditions have a common origin, in so far as they are primarily developmental, being due, as they put it, to "excess of physiological fusion," as the attachments of the various parts of the alimentary canal to the abdominal wall are formed during development. They reject Lane's view of their formation and the idea that they are primarily inflammatory in origin. They maintain that if Lane's view that the adhesions represent crystallization of lines of strain were correct, the adhesions should be found in the upper layers of the mesentery and mesosigmoid, on which strain would act most strongly. Further, in many cases the ileal membrane said by Lane to be due to the strain caused by a dropped cecum has been present where there was no ptosis of the cecum at all. They cannot accept the view often advanced that Jackson's pericolic membrane is inflammatory in origin, because of the astonishingly regular anatomical character of the best examples. The linear distribution of its vessels is quite unlike the radiating arrangement of the vessels in adhesions due to inflammation. The fact that many of the best marked cases have not been associated with symptoms, local or general, either as cause or effect, is regarded as additional evidence of their congenital origin, while the occurrence of several cases in children under five years of age lends additional support to this view. Gray and Anderson regard Jackson's membrane simply as an unusual arrangement of the right margin of the great omentum, with which it often has an uninterrupted connection. The view taken by the writers has much to support it, and certainly appears to give a much more rational explanation of the conditions named than the views advanced by others. An interesting suggestion made is that these adhesions or abnormal fusions have much to do with the production of visceroptosis.

In describing the symptoms produced in some cases by the adhesions the authors differentiate between those of a chronic and those of an acute type. The chronic symptoms are general and local, the general being those of autointoxication, staining of the skin, excessive sweating, enfeebled circulation with cold extremities, slightly swinging temperature, loss of flesh, dulling of mental faculties, headache, painful joints, cystic degeneration of the mammæ, which is liable to be followed by cancer; the local symptoms being a distended heavy feeling in the abdomen, with twinges of pain and borborygmi, relieved or intensified by changes of posture, and constipation in varying degree. A bismuth meal may be seen to be delayed or arrested where the adhesions are most marked. The acute symptoms are similar in character but more intense, pain of a dragging character, with colicky exacerbations and tenderness over the affected part, being present, while signs indicating complete intestinal obstruction may develop.

The treatment consists in the free division of the adhesions, great care being taken to avoid leaving raw surfaces likely to lead to the formation of fresh adhesions. Several illustrative cases are described, and the operative methods employed in remedying the conditions found are explained.

The authors state that all their patients have been relieved of pain and most of them have regained normal health. Finally, they state that their paper has been written with the objects of elucidating the etiology of the conditions named and of stemming what is apparently a growing impression, that exclusion of the colon by ileoproctostomy, or even actual removal of the colon, is the operation of choice in the treatment of these cases.

LOCAL ANESTHESIA IN THE PELVIS.

FRANKE and POSNER (*Archiv f. klin. Chirurg.,* Bd. xcix, Heft 1) describe a method successfully used in Wilm's clinic for producing analgesia for perineal prostatectomy, etc. Their plan, which was first worked out on the cadaver, using colored solutions, is as follows: A one-per-cent novocaine solution without adrenalin is used. From a point 2 to 3 centimeters from the middle line, just in front of the anus, a needle 12 to 15 centimeters long is entered and pushed on in the long axis of the trunk, with the patient in the lithotomy position, till the resistance imparted by the levator ani muscle is felt. With a finger in the rectum the ischial spine is felt, and the needle pushed on under its guidance till it strikes the pelvic aspect of the ischial spine. By withdrawing the needle a little, depressing its point, and again pushing it on for 2 to 3 centimeters, it comes to lie just on the outer aspect of the ischial spine, and if 10 to 15 Cc. of solution are injected there, the internal pudic nerve will be paralyzed. This maneuver is repeated on the other side, and the needle is then pushed up in the midline between the rectum and the prostate and 10 to 15 Cc. of solution distributed in the connective tissue between the base of the bladder, the prostate, and the rectum. As the needle travels to its various destinations small quantities of novocaine may be injected on the way. Finally, the subcutaneous tissue is infiltrated from the ischial tuberosity forward for 7 to 10 centimeters on each side. By this means analgesia of the lower rectum, the anus, perineum, scrotum, penis, urethra, bladder, and prostate can be attained, and is usually complete fifteen minutes after the injections have been made. The method has been used with success, more especially in doing perineal prostatectomy by Wilm's method.—*Edinburgh Medical Journal,* December, 1912.

CHRONIC INTESTINAL STASIS.

LANE (*Lancet,* December 21, 1912) employs the term chronic intestinal stasis to indicate an abnormal delay in the passage of intestinal contents resulting in absorption of poisons which produce degenerative changes in every tissue and in every organ of the body. The liver is the most important converter of poisons and the kidneys are chief excreters. Hence it is in these structures that the lesions are probably earliest and most pronounced. Whilst agreeing with Metchnikoff to the effect that if the large bowel were removed we would live longer, Lane holds that in a considerable proportion of cases the chief bulk of absorption takes place in the small intestine, and that the control of the effluent in the ileum is the fatal product of civilization.

Stasis of the small intestine with the associated infection of its contents by organisms to which it is unaccustomed is not primary but is secondary to a stasis in the large bowel. In other words, if it were not for the presence of the large bowel the conditions producing stasis in the small intestine would not arise. If the cecum did not become overloaded, the obstruction to the ileal effluent, either by an acquired mesentery, an appendix hitching it up, or by simple stasis, would not develop. Consequently the contents of the small intestine would not become infected by organisms, the duodenum would not be blocked by the

drag of the small intestines, obstructed at the end of the ileum, the mucous membrane of the duodenum would not inflame and ulcerate, the biliary and pancreatic ducts would not be infected, and the obstructed outflow from the stomach with all its associated sequelæ would not occur.

The extraordinary improvement that results from short-circuiting and the disconnection or removal of the large bowel is due largely to the fact that the evacuation of the small intestine is facilitated by its introduction into the pelvic colon, and that the infection of its contents by organisms which grow in the stagnating material in the large intestine ceases abruptly. The point of greatest difficulty in the passage of material along the gastrointestinal tract is through the last few inches of the ileum. This is particularly the case when the cecum has been securely fixed by acquired adhesions in the iliac fossa. In such cases the delay of the effluent at the pelvic brim may be very great.

This form of simple obstruction, which cannot be recognized at the time of the operation and can only be determined by bismuth and *x*-rays, Lane calls the "simple static variety," as opposed to the more obvious variety, in which the bowel is controlled by an acquired band or by an appendix, either of which is readily recognized when the abdomen is opened, though the extent of its effect on the effluent can only be gauged by bismuth and *x*-rays.

Since with an apparently uncontrolled ileal termination delay in the effluent may be very considerable one can readily see how a structure which by strain or pressure exerts apparently but a comparatively slight constricting influence on the lumen of the bowel may affect very materially the passage of the contents through it. The duodenum ends usually in such a manner that its effluent can be controlled by the exercise of a vertical downward traction upon the jejunum. Lane believes that to obviate this mechanical disability the commencement of the jejunum becomes attached progressively to the posterior abdominal wall by an evolutionary process, so that, in the highest state of development, having become attached to the under surface of the transverse mesocolon in a direction from left to right, this portion of bowel is fixed in the form of a semicircle.

CONSERVATIVE TREATMENT OF TUBERCULOUS GLANDS OF THE NECK.

Brown (*Medical Record*, Jan. 4, 1913) after a lucid discussion of the pathology of the lymph glands in general and of tuberculous lymph glands in particular, observes that his former custom was to treat all single glands, whether with or without sister glands, first, by removal of the portals of infection, tonsils, adenoids, etc., and secondly, by simple incision of the suppurating foci. This often resulted in a second infection. The treatment was therefore supplemented by Bier's hyperemia applied by means of a simple elastic band about the neck for a few hours before opening the abscess, thus increasing edema and cellular proliferation.

Then a very small straight incision into the gland, evacuation of the contents by a dull spoon, using no force or rough manipulation, and being careful not to break through the capsule nor to invade the protective phagedenic zone; and without washing or wiping out the cavity, the introduction of 2- to 4-per-cent formalin in glycerin and sealing the incision. Primary healing in 50 per cent of the cases; of the remaining 50 per cent, 30 per cent have only a serous discharge, which ceases after three or four more injections, and the remaining 20 per cent suppurate, more or less, depending on the delicacy and completeness of technique.

At the same time as this local treatment there was begun a more systematic attempt to increase the general resistance of the patient: forced feeding, twenty-four hours a day out-of-doors, and other methods of treatment which were recognized as applicable and beneficial in all cases of tuberculosis. The treatment of these simple cases was so successful that the author ap-

plied his methods to more extensive gland involvement.

At this point he introduced the injection of tuberculin B. This procedure, so far as he was able to tell, had little or no effect (sixteen cases). He would probably have given it a more extensive trial had he not been induced by Prof. J. E. Temple of Cornell to try the enzymes of yeast. This has seemed to be the connecting link needed in the treatment. Since that time he has applied it in more than eighty-five cases. Fifteen of these cases were treated until he became satisfied that some more radical method was indicated to start the process of body repair.

Of the other seventy cases fifty-six are well without gland involvement; ten are recent cases under treatment; three were lost sight of after the first treatment; and an infant with both cervical lymph-chains involved died with some intercurrent summer diarrhea while away from home.

Though these cases are limited in number, the writer feels that he has had sufficient experience to recognize the type to which conservative treatment is applicable. In a general way it may be said that any superficial gland, or chain of glands, may be treated in this way, providing we can satisfy ourselves that the caseous masses are acting as foreign bodies. It must be remembered that not the tubercle but the germ is harmful. Opening allows the escape of toxins, and of the caseous material which acts as a foreign body, preventing granulation and approximation of surfaces. This caseation is the result of the tubercle, due in part to coagulation necrosis from anemia, to toxins from the bacillus, and to an enzyme found by Opie and others in the epithelioid cells themselves.

In yet another class of cases treatment by incisions, injection, and exhibition of enzymes is markedly efficacious; namely, the rapidly developing abscess of the adult, sequent upon a glandular tuberculosis. This condition is not infrequently bilateral, and the abscess has the characteristic tuberculous tendency to burrow, often extending along fascial planes to the chest, or penetrating between muscles of the shoulder girdle. Under the treatment indicated, the abscess heals rapidly with minimum of suppuration, though its cavity may have contained a quart or more of cold pus.

Sometimes, even though the small incision is omitted, the caseous matter may disintegrate, may be invaded by granulation tissue, and healing by hyaline scar may ensue; or it may be surrounded by fibrous tissue and compressed to a tiny spot; or its fatty acids and soaps may combine with calcium salts, becoming firmer and more friable, and eventually be definitely calcified. All these processes of self-cure are common.

Large, multiple, deeply-seated glands are not to be dealt with by conservative methods. A more radical procedure is necessary, since these glands are all caseous with a conglomerate of tubercle producing many foci of dissemination often matted together, and, as can readily be seen by open dissection, lie one above the other, the lowest not being felt until the others are removed. An exaggeration of this type is often mistaken for Hodgkin's disease, since the glands are so large and numerous as to form a collar about the neck.

"Radical operation" for cervical glands is a misnomer. No operation for this disease can be radical, since the glands are so numerous that complete removal is impossible. The most we can do is to remove the lymphatic chain involved, with its infected outlying glands and the gland-bearing fascia. Such an operation presupposes a proper knowledge of anatomy; it does not mean a limited incision, but open-work exposure of the vein and avoidance of the motor nerves. Any half-hearted dissection, without removal of the gland-bearing fascia, is meddlesome surgery; and if the result of such an operation is satisfactory it is sufficient evidence that the case was one deserving more conservative methods of treatment.

Scrofula is a tuberculosis of the patient, not merely of the glands; hence, prophylactic and therapeutic hygiene as well as local treatment is indicated.

Complete extirpation of the disease is

impossible, and if given opportunity nature tends to cure; hence judgment as to treatment is necessary.

The glands have an important protective function; hence the surgeon should employ no more radical method than he must, and the glands should not be carelessly sacrificed.

In a great majority of the cases the removal of the caseous masses by a proper technique is all the local surgery needed.

The enzymes of yeast seem to be of benefit.

THE TECHNIQUE OF TUBAL STERILIZATION.

TAUSSIG (*Surgery, Gynecology and Obstetrics,* January, 1913) notes that simple ligation of tubes with excision of a small piece has not been uniformly successful, probably owing to the patency of the uterine end of the tube after the ligature of the tube had cut through. Similarly the excision of the interstitial portion of the tube at the uterine horn resulted in one of Kuestner's cases in pregnancy following the operation through the formation of a utero-abdominal opening. Asch and Labhardt employ a technique by which the cut end of the uterine portion of the tube is slipped within the folds of the broad ligament. The objections to this technique are the possibility of a small rent in the peritoneum of the broad ligament, allowing of possible impregnation, and the danger of the development of a hydrosalpinx in the sealed portion of the tube. It is this same likelihood of a hydrosalpinx that is in the writer's mind so strong an objection to those methods of sterilization in which the fimbriated ends of the tubes are either sewed into a fold of the broad ligament or drawn upward through the inguinal canal and there tied off. It therefore seemed wise to somewhat modify the technique heretofore employed.

The technique of his operation is as follows: The abdomen is opened by a small median incision in the usual manner and the uterine end of one Fallopian tube seized with forceps. The uterus is thus pulled into view so that a suture can be passed through the uterine horn at the tubal insertion. Before tying this suture, the interstitial portion of the tube is cut away by a V-shaped incision. Next, the tube is freed from its peritoneal attachment for a distance of about one inch, and a ligature having been thrown around the distal end, this free portion of the tube is resected. The needle is left threaded in the ligature thrown around the tube.

With an artery forceps or Mayo dissecting scissors the layers of the broad ligament are separated from each other at the point where it has been opened up. Catching the end of the tube with an extra suture to prevent it from slipping, the threaded needle is now passed through the open space in the broad ligament, and emerges just anterior to the round ligament near the attachment of the vesical peritoneum to the uterus. An extra suture is passed through the peritoneum at this point so as to completely bury this end of the Fallopian tube in the broad ligament.

The third step in the operation consists of sewing the round ligament by one or more sutures to the upper posterior surface of the uterus, thus closing over the point of the tubal insertion and the small open space in the peritoneum of the broad ligament.

The same technique is observed in resecting the tube of the other side, and the abdomen closed in the usual manner.

In cases of movable retroversion the round ligaments can be folded back far enough to meet in the median line on the posterior surface of the uterus and hold that organ forward and upward.

The advantages of this technique are its greater security against possible conception. The steps are so simple and easy as to require but a few minutes, and the additional precautions would seem to be worth while.

To specify the advantages of the technique employed, we have:

Resection of the narrowest part of the tube (the interstitial portion).

Closure of the uterine wound by a double layer; the first of the uterine wall, secondly of the round ligament.

Burying of the proximal end of the cut tube far away from the uterine horn.

Prevention of hydrosalpinx by leaving the fimbriated end of the remaining portion of the tube open.

The operation just described can be done vaginally as well as abdominally, but, except for patients with prolapse or relaxed pelvic floor, the abdominal route is preferred on account of its simpler technique.

RICHTER'S HERNIA.

FOWLER (*American Journal of Surgery,* January, 1913) notes that cecal hernia is found at all ages, usually at the extremes of life. Richter's hernia is defined as abdominal hernia in which a portion of the circumference of the bowel is imprisoned, reducing, but not entirely obliterating, a portion of the intestine. It is more common in females and is apparently limited to adults. The lower limb is the portion usually engaged. In some cases the lumen may permit fecal passage. The symptoms are unreliable and misleading, and present little uniformity. The gravity of the case depends upon the condition of the bowel, and there are no symptoms to serve as an index of intestinal viability. The cases have symptoms suggestive of intestinal obstruction. In about one-third the symptoms are typical of this condition. In the remainder they are much less severe and are those of a mild, incomplete obstruction. In one-tenth of the less severe cases there were bowel movements on the first or second day. The vomiting is of a mild and intermittent type. Fecal vomiting is present in about 12 per cent of the cases, the earliest on the second day, the latest on the eighth day. The bowel may be in a gangrenous condition without the existence of fecal vomiting. In the writer's case there was no vomiting. Complete obstruction is not unusual. It is well to remember in this connection the experiments of Scarpa that if more than two-thirds of the bowel circumference is encroached upon, the passage of water through the intestine is arrested by angulation of the intestine. Constipation is a consistent symptom. Diarrhea, however, has been present and is a bad omen. Obstipation is the general rule. Distention of the abdomen is not marked, as these constrictions are water-tight before they are air-tight.

The clinical diagnosis is difficult and has been made in about 50 per cent of cases. In half of the cases no swelling was discovered. When it is determined by palpation it presents the character of an irreducible hernia, inflamed or strangulated. The condition simulates a small incarcerated omental hernia. The mortality is high; all those cases died which were not recognized during life. Treves places the mortality at 62.2 per cent.

There is but one treatment, and that is operative. The bowel should be dealt with as in other cases of strangulated hernia and the radical cure done if the patient's condition will permit it.

THE COMPLETE REMOVAL OF PLEURAL EFFUSION BY OXYGEN REPLACEMENT.

DAVIES (*Lancet,* Dec. 28, 1912) remarks in regard to aspiration that it is not devoid of danger; that as a general rule not more than 50 per cent of the fluid present can be withdrawn at a single tapping. Therefore the subsequent radiograph is more or less useless. Distress—*i.e.,* cough and pain—often appears when only 1 or 1½ liters of fluid have been withdrawn, yet the desire to take out as much fluid as possible tempts the operator to continue the aspiration after these symptoms have first appeared, thereby increasing the risks of edema or cardiac embarrassment. When one side of the chest is full of fluid the removal of 1500 Cc. is regarded as most satisfactory, but skiagrams will show that there is still an astonishing amount left behind. As the chest is a closed chamber it is obvious that if fluid is withdrawn either a rapidly increasing negative pressure must be produced or the fluid must be replaced by some other substance. In paracentesis both mechanisms are brought into play, but there is a limit to

the rapid alteration in the position of the mediastinum and to the expansion of the lungs when these are the seat of fibrotic changes or are surrounded by a thickened or adherent pleura, and when the traction exerted on these by the increasing negative pressure exceeds a certain grade the symptoms of distress so constantly seen during paracentesis are produced.

The clear recognition of these facts suggests that if it were possible, during the process of withdrawing fluid, to modify the intrathoracic changes produced by the increasing negative pressure, by introducing from without some non-irritating sterile substitute, the whole of the fluid could be withdrawn. The most obvious substitute is air, but it is found that of the three principal gases of the atmosphere, oxygen when in contact with the pleura is absorbed rapidly, while the nitrogen and carbon dioxide are absorbed at a much slower rate. Since, however, it is desirable that the pneumothorax produced should be absorbed as quickly as possible oxygen is preferable instead of air for the replacement of the fluid in all cases.

Fortunately, the methods which have been elaborated for the safe introduction into the pleura of measured quantities of nitrogen in cases of phthisis are equally applicable to the introduction of oxygen. When, however, oxygen is being used as a substitute for fluid the needle designed for the introduction of nitrogen is useless, as the bore is too small to allow the transmission of the respiratory movements of the chest to the manometer. It is, of course, an absolute *sine qua non* that no gas is introduced into the chest unless the manometer, giving undulations which correspond with the respirations, indicates with certainty that the point of the needle is in the pleural cavity. The lumen of the cannula is 1 mm. in diameter, and the point of the needle lies flush with the oblique and sharpened end of the cannula in the same manner as in a spinal needle and cannula.

The patient lies in a semirecumbent position well propped up in bed, turned slightly on to the sound side with the arm on the affected side well forward. The skin between the anterior and posterior axillary lines is painted with iodine, and the fifth and eighth intercostal spaces are marked in the midaxillary line. A hypodermic needle filled with 2-per-cent novocaine is first used, and an area of skin the size of a threepenny-piece is infiltrated, and the needle of the syringe is then pushed through the center of this area into the intercostal space, the piston being meanwhile driven home. A small incision 3 mm. long is now made through the infiltrated skin with a double-edged tenotome knife. Five cubic centimeters of novocaine is drawn up into a record syringe fitted with a needle 5 cm. long; the needle is passed through the incision and pushed slowly through the intercostal space, the novocaine being slowly injected all the time until the point of the needle is felt to slip through the pleura. The piston is then withdrawn and fluid should appear in the syringe, giving evidence that the effusion has been reached and confirming the nature of the same. When this has been done in both interspaces the needle connected with the aspirating bottle and vacuum pump is passed through the lower anesthetized area into the fluid, while the needle connected with the oxygen apparatus is passed through the upper anesthetized area. It is hardly necessary to emphasize the importance of testing both pieces of apparatus before use—*i.e.*, seeing that fluid is sucked up through the one needle into the aspirating bottle, and that oxygen does pass out through the other needle. When the needles have been introduced it is absolutely essential that the manometer connected with the upper needle should show respiratory movements, and until and unless these are obtained no oxygen must be allowed to escape through the needle. Fluid is now aspirated from the chest and the aspiration continued until the patient either coughs or experiences the slightest pain. The aspiration is then immediately stopped, and 50 Cc. or 100 Cc. of oxygen is allowed to run in slowly. The

pain or cough will at once disappear, and the aspiration is continued until the recurrence of some symptoms demands the introduction of more oxygen. This process is continued until no more fluid can be withdrawn. Toward the end of the process oxygen will be found to escape with the fluid, and the proportion of oxygen introduced to fluid withdrawn must be increased.

If this procedure is carried out efficiently the patient experiences practically no distress, either during or at the end of the process, and a skiagram taken at the conclusion will show the almost complete disappearance of the fluid and a small pneumothorax, while the lung, no longer obscured by the fluid, permits of complete radioscopic and radiographic examination.

By partially substituting oxygen for the fluid withdrawn the operation of paracentesis can be performed with a minimum of discomfort to the patient, and without the occurrence of those symptoms of distress so commonly manifested toward the conclusion, and often lasting for some time afterward; the whole, instead of only a portion, of the fluid can be withdrawn; and the lung can be cleared so as to permit of complete radioscopy and radiography. This method of oxygen replacement has still further advantages.

In certain cases, in which there has been an inflammatory reaction of the pleura and the lung has been completely collapsed by fluid, the lung is incapable of any or of complete expansion owing to the thickening of the visceral pleura or to the formation of adhesions. When the lung is capable of partial expansion it is probable that if a steady traction could be exerted on its pleural aspect the adhesions and thickened pleura would gradually yield, and the visceral and parietal layers finally come into apposition. This can be effected if oxygen is allowed to replace the fluid. Two processes are at work in connection with the intrapleural oxygen—the one an absorption of the gas and the other an interchange of gases. The absorption is the more rapid process, and in about sixty hours after the introduction of oxygen it will be found that most of the oxygen is absorbed, but there is still some gas in the pleural cavity; this gas consists of nitrogen and carbon dioxide. These gases in their turn are absorbed, but more slowly. The effect of this is to produce a steady traction on the lung, which causes it slowly to expand. In some cases, it is true, there may be some reaccumulation of fluid, necessitating a second paracentesis with substitution of oxygen, but in all cases in which the lung is capable of expansion the effect of the traction on the lung is marked.

When the lung is incapable of expansion it may be possible to relieve the patient of the weight and the discomfort of having one side of the chest filled with 3 or 4 liters of fluid by replacing this fluid by oxygen. The value of the oxygen over nitrogen in such a case is that until the whole of the fluid has been drawn off it is impossible to estimate the degree to which the lung is bound down. If this fixation is complete oxygen is automatically replaced by nitrogen and carbon dioxide.

APPARATUS FOR CONTINUOUS ASPIRATION.

MENZIES (*Canadian Medical Association Journal*, January, 1913) describes an apparatus which in some of its modifications is now used in general hospitals. The suction pump is an ordinary filter pump which may be obtained from any first-class dealer in laboratory supplies. The one described by the author has a diameter of five-eighths of an inch and the upper end is threaded to fit any pipe connection of that diameter. In the operating-room the inside of the faucet may readily be threaded to fit the pump. To be used in the wards, where the taps are of various sizes, a firm rubber cork may be perforated and fitted over the upper or threaded end of the pump. The whole can then be forced into the mouth of the faucet, and thus used it works successfully. The receiving bottle has a capacity of 32 ounces, and is fitted with a rubber cork,

perforated by two bent glass tubes. This bottle is hung in a sling. The tubing used is of pure gum rubber and has a bore of three-sixteenths of an inch. By turning on the tap water a partial vacuum is produced in the bottle and in the tube, which is connected with an aspirating tip.

This apparatus is readily applicable to harelip and cleft palate work, tonsillectomy, the removal of pleural effusions, bronchoscopy, and esophagoscopy. It is much simpler than the old Potain aspirator and there is really nothing to get out of order. It is started by turning on the water, and it will last for years. When once started, by turning on the water, it will produce a continuous vacuum, and will need no further attention till the receiver becomes filled with the aspirated fluid. When this occurs the bottle may be removed and emptied without any difficulty, and the process continued. Unless powerful suction is wanted it may be controlled by shutting off part of the water or by controlling the tube through which aspiration is practiced.

CECOSIGMOIDOSTOMY: AN OPERATION FOR SHORT-CIRCUITING THE COLON.

YEOMANS (*American Journal of Surgery,* January, 1913) proposes a method of short-circuiting to relieve intestinal stasis, which he has done in three cases with complete success. The method consists in anastomosing the cecum with the sigmoid. He believes that often the operation is anatomically impossible, but in cases of advanced visceroptosis he made a much better solution of the drainage problem than that offered by ileosigmoidostomy. He regards the operation as safe, easy, mechanically efficient, establishing drainage of the entire colon, there being no blind ends left for collection of feces, fermentation, and intoxication; it observes the surgical principle of draining the colon at its most dependent point, a principle correct, both in theory and in practice; it anchors and drains the cecum mobile of Wilms; it anchors and drains chronic volvulus of the sigmoid or a giant sigmoid; it cures permanently constipation due to mechanical obstruction at any point in the colon from cecum to apex of sigmoid.

PRESENT VALUE OF THE WASSERMANN REACTION.

MILNE (*American Journal of Medical Sciences,* February, 1913) holds that the exact interpretation which can be placed upon the application of the Wassermann reaction to the diagnosis and treatment of syphilis is not yet sufficiently definite.

He points out in the primary stage of the disease the number of positive variations in the reports of various authorities, from 64 to 92 per cent. In most cases a positive reaction can be obtained in about the fourth week, and a definite diagnosis can generally be obtained a week or two before the appearance of the secondary eruption. In about 40 per cent of cases the Wassermann reaction is positive when the initial sore appears. Lesser has reported a positive reaction as early as the eighth day after exposure. In this the initial lesion appeared fourteen days later. He then states that in his own experience in about 9 per cent of cases in which no treatment has been received the reaction did not become positive until the first or second week after the development of the secondary eruption. Neisser has shown that with the development of a positive reaction the lymphatic glands and other tissues of the body become capable of transmitting the disease to apes. In secondary syphilis practically all untreated cases gave a positive reaction, though its appearance may occasionally be delayed until one or two or sometimes three weeks after the period of secondary eruption.

In the tertiary stage, positive reactions are reported in 60 to 100 per cent of cases, but more correctly in about 80 per cent. When tertiary lesions are active they are almost always associated with a positive reaction.

After the clinical signs of syphilis have disappeared many cases, although appar-

ently in good health, remain in a latent syphilitic condition. Reports in this phase of syphilis average about 65 per cent of positive reactions in the early latent stage, and as many as 47 per cent in the late stages. Relatively few cases of cerebrospinal syphilis give positive reactions in the spinal fluid. If larger quantities of the fluid are used for the test reactions closely follow the results obtained in the blood serum. Cases of aneurism give positive reactions in about 70 per cent of all cases. This is also true in regard to aortic incompetency, which in the majority of cases is syphilitic in origin, therefore not differing in etiology from mitral disease. All other cardiovascular lesions, excepting aortic incompetence, give only 24 per cent of positive reactions, this latter figure undoubtedly showing the high incidence of cardiac disease in syphilis. Mesaortitis, or syphilitic aortitis, occurs in about 82 per cent of paretics, but in only 10 per cent of syphilitics, and this therefore is as truly a parasyphilitic lesion as tabes or paresis. It is the essential lesion which is the precursor of most cases of aortic aneurism. Of all cases of arteriosclerosis only about 12 per cent give positive reactions, showing that this disease may be produced by many other factors even as common or more commonly than by syphilis; and also that aneurism in nearly every case has a syphilitic basis. When we find it reported that in all cases of keratitis, exclusive of suppurative cases, 84 per cent, in iritis 38 per cent, in retinitis and in choroiditis 26 per cent, give positive reactions, the importance of this test in diseases of the eye is evident, particularly as an indication for therapeutic measures. It has also been shown that the disease is generally, but not always, of syphilitic origin. Leprosy gives a positive reaction, according to Noguchi, in over 70 per cent of cases; scarlet fever also from 1 to 50 per cent. In yaws and trypanosomiasis the Wassermann reaction is also described as frequently positive; so also in some occasional cases of anemia, tuberculosis, cancer, lymphadenoma, leukemia, etc.

The value of a negative report is not yet definite. It is held that with the method of treatment at present adopted tertiary, latent, or late syphilitic manifestations should be eliminated. A serum should not be examined for the Wassermann reaction before one month after the cessation of treatment, as negative results before this are of little importance. A negative result six months after the termination of treatment would seem to indicate a cure. If, however, the reaction has again become positive an entire new course of treatment must be instituted. In old cases the treatment must at times be very vigorous and prolonged before the serum becomes permanently negative. Serum diagnosis has demonstrated the inefficiency of mercurial treatment by internal administration. It has shown the efficiency of treatment by salvarsan and neosalvarsan, and also that combined with hypodermic injection of mercury salts it is better than either alone.

SOME OF THE DISPUTED PROBLEMS ASSOCIATED WITH THE LARGE INTESTINE.

WILLIAM J. MAYO (*American Journal of the Medical Sciences,* February, 1913) observes that while in the adult human the large intestine appears as a continuous whole, yet functionally it is sharply delimited at the point of vascular anastomosis between the derivatives of the superior and inferior mesenteric vessels at the splenic flexure. The first half of the large intestine is derived from the same embryologic sources as is the small intestine, and has a similar important metabolic function. About 50 per cent of the fluids and 10 per cent of the solids are absorbed in this part of the large intestine. Beyond the splenic flexure absorption is limited in amount, the bulk of absorbable material placed in the rectum being promptly passed into the proximal colon for absorption.

It has been shown by Bond, Cannon, and others that there is a fairly constant antiperistalsis in the large intestine which passes material back toward the cecum.

The study of comparative anatomy in the herbivora demonstrates the enormous absorptive value of the cecum. Lyle has aptly compared its storage function to the stomach. Unlike the stomach, which absorbs but a small amount, the cecum absorbs actively. In some animals there is a sphincter in the ascending colon to hold the material in the cecum. In man a marked physiological activity is shown at this point, although no colic sphincter exists.

The portion of the duodenum which lies between the pylorus and the opening of the common duct may be said to be the vestibule of the small intestine, the food passing rapidly through to reach the area of absorption. In a general way the same conditions exist in the descending colon, which also acts as a vestibule through which food refuse passes rapidly to reach the storage chamber of the sigmoid. The splenic flexure of the colon is held high, as a mechanical means of maintaining food products as long as possible in the first half of the large intestine. This method of retention is more economic in its operation than a muscular sphincter apparatus would be. Some sixty years ago Rokitansky called attention to the fact that the descending colon was usually found empty at autopsy, just as the *x*-ray bismuth picture of to-day so often shows it in the living, and which is at times misinterpreted as evidence of supposed stricture.

In an article written in 1900 Mayo called attention to a contraction of the ileocecal orifice as a cause of certain intestinal phenomena, and pointed out that many cases of constipation might have their origin in metabolic changes in the small intestine rather than in the large. This helps to explain the obstinate constipation which sometimes continues after an ileosigmoidostomy, although such stasis is largely due to the fact that the material from the ileum as it enters the sigmoid passes backward by an antiperistalsis into the first half of the large intestine and then pursues its ordinary course much as though ileosigmoidostomy had not been done. This has been demonstrated in the *x*-ray findings following ileosigmoidoscopy in some of Mayo's cases.

The sigmoid varies greatly in its length, size, and position because it is a late development without fixed characteristics. This is further shown in the weakness of its walls, which in the middle and later decades of life so frequently permit hernias of the mucosa through the musculature. These hernias or diverticula are an important factor in the causation of localized peritonitis from diverticulitis, as well as occasionally the chronic irritating focus in initiating cancer of the sigmoid.

The rectosigmoid juncture is at the third sacral vertebra, and here nature has again introduced certain mechanical obstacles to prevent the too ready discharge from the storehouse of the sigmoid into the rectum. So often a well-trained nurse asks, "Shall I give a high injection with the colonic tube into the colon or a low rectal?" The colonic tube pushed through the anus out of sight lies coiled in the rectum when it is supposed to be in the colon. Such a tube cannot often be made to pass through the rectosigmoid in this manner.

The rectum is not normally a fecal storehouse, although through habit it often becomes so, especially in the female. Examination of the male for service in the army shows the rectum to be empty normally.

Bands of adhesions are often developed during adult life. At the time of birth the cavity of the omentum is obliterated as high as the transverse colon. The process continues until in adult life points of adhesion are found as high as the pyloric end of the stomach which obliterates the lesser cavity of the peritoneum to a greater or less degree. Similar conditions may exist between the omenta and the gall-bladder, and may be taken as evidence of infection. Various observers have asserted that the adhesions which sometimes exist between the epiploic tags of the sigmoid and the abdominal wall, etc., are of great importance, and always the result of pathological conditions; yet such adhesions will be found in a certain

percentage of necropsies on subjects over forty years of age, who during life showed no symptoms ascribable thereto.

Jackson has called attention to the veil of adhesions so often present between the ascending colon and the abdominal wall as a cause of pathological symptoms. We can at least say safely that this condition, like the others mentioned, is developmental in origin. The cecum does not reach its normal situation until about the time of birth, therefore the attachment between this late arrival and its fixed place of abode is recent, and resembles adhesions of a peculiar pannus type. The weakness of this attachment on the right side is partially instrumental in permitting the prolapse of the cecum into the pelvis. Wilms believes this prolapse to be of great pathological significance in producing cecal stasis. "Lane's kink" is undoubtedly also of developmental origin, and due to a fixation by bands of the terminal three inches of the ileum. The important question is, Do these conditions produce symptoms, or are they merely anatomical deviations without pathological meaning?

The transverse colon averages in length from 20 to 22 inches, and has 10 or 11 inches distance to travel from the hepatic to the splenic flexures. Its supporting attachments in the center are to the movable stomach, therefore prolapsus of the transverse colon is common. There is little else it can do. The length of the transverse colon serves a physiological purpose in picking up the final remnants of nutritive material. The *x*-ray photograph taken with the patient in the standing position, with the weight of the bismuth in the stomach or in the transverse colon, or both, produces an exaggeration of this normal condition. How often can we say that it is truly pathological?

If the small bands of adhesions which are found in one case, such as a sigmoid-epiploic tag attachment to the abdominal wall, be productive of so much harm in one patient, how can we expect that another patient with similar symptoms will be benefited by the bands of adhesions which the surgeon purposefully forms to hold up a prolapsed organ like the cecum? How much of truth and how much of fancy is embodied in the elucidation of this subject no one can say. That it is most obscure we all agree. One group of observers is convinced that the whole thing is mechanical and the result of some type of infection rather than an error of development. Another group contents itself with the belief that these patients are all neurasthenics, although they are less ready to give an opinion as to the cause or nature of the condition. That many of the patients operated on have been greatly benefited cannot be denied, yet if one were to take the case histories and reports of successful treatment by means of mechanical therapy and put them all in a hat to be picked out at random one could not determine from the histories of the patients those who had been relieved of symptoms by operating for a mobile cecum, for relief of the adhesions, for mobility of the sigmoid, for fixation of the sigmoid, for prolapse of the stomach, and, for that matter, for movable kidney. The histories read alike, but the operations seem to vary with the bias of the operator. Are all of these deductions wrong? Have the profession in regular medicine with their accurate observations no conclusions which depend upon more authentic data? To say that relief of symptoms demonstrates the truth of the opinion is not sufficient unless we grant the same privilege to the mental healers.

Mayo thinks we can agree with Arbuthnot Lane that metabolic changes may take place in the large intestine, which in some cases produce symptoms of disease, and that absorbable toxic products are responsible for many of the symptoms which are spoken of in a general way as gastrointestinal neurosis, intestinal toxemia, intestinal stasis, putrefactive intoxication, etc.

It is probable that the first part of the colon, and especially the cecum and ascending colon, will be found at fault. To it is delegated the difficult function of culling

out the last nutritive remnants from the now infected mass of food. Carcinoma of the cecum and ascending colon are often accompanied by the most profound anemia in cases without glandular or general metastasis. We not infrequently see a removable tumor and a perfect cure follow an operation upon a patient so anemic that the hemoglobin runs as low as 30 and the reds in the vicinity of 2,500,000. Many such patients have been left to die because this specific anemia was believed to be a cachexia from hopeless malignant metastasis.

This same anemia may accompany tuberculous tumor of the cecum of the hypertrophic variety without ulceration to explain it, but is not found to accompany tumors of the sigmoid even though there may be sloughing.

It is possible that all of these mechanical conditions have some effect in detaining the infected remnants of food too long in the absorbing half of the colon, the symptoms being due to the effect of the toxic products absorbed on the controlling sympathetic ganglia. That the theory of mechanical causation alone is insufficient explanation is established by the fact that, as a rule, none of the ordinary results of mechanical obstruction exist, such as muscular hypertrophy of the wall of the bowel, etc. Quite the opposite condition exists—the bowel is thin-walled and ballooned, the patients showing marked evidence of loss of sympathetic balance of the neurasthenic type, resembling in some respects a mild Graves's disease from hyperthyroidism.

The views of Arbuthnot Lane, Rovsing, Coffey, Jackson, and others should receive careful consideration. Whether or not the particular operations advocated by these surgeons are ultimately found to be correct, at least their work has called the attention of the profession to an important and heretofore neglected field, and offers a possible explanation of the cause of the protean symptoms in a large group of patients who have received much treatment and little benefit from the medical profession, and who have been exploited by the dietetic faddist and the charlatan.

REVIEWS.

DISEASES OF THE HEART AND AORTA. By Arthur Douglas Hirschfelder, M.D. With an Introductory Note by Lewellyn F. Barker, M.D., LL.D. The J. B. Lippincott Company, Philadelphia, 1913. Price $6.00.

Less than three years ago we noticed the appearance of the first edition of this useful work. It embodies the most thorough and careful consideration of the physics and physiology of the circulatory apparatus, both in health and disease, with a description of practically all instruments of precision which are used in studying the circulation at the bedside or in the laboratory at the present time. In addition to this it is copiously illustrated in black and white and also by colored plates, altogether containing no less than 342 illustrations, of which 19 are in colors. Any medical man who possesses himself of this volume may well consider that he has placed in his library the latest and best literature dealing with this very live topic, which has been so largely reformed during the last six or eight years. If, in addition, he buys Mackenzie's well-known book and that of Lewis on "The Mechanism of the Heart-beat," he will be most adequately supplied. Most of the chapters in the present volume are supplied with very copious bibliographies, so that the volume is not only a working handbook but a useful one for reference as well. Notwithstanding the use of small type to save space, we cannot help feeling that with a little effort the author might condense his volume considerably. Certain portions seem to overlap. On the other hand, it may be well said that so complex a topic is difficult of consideration without overlapping. The point that seems to us most praiseworthy in the volume is the

great amount of reading and original research which the author must have carried out in order to bring together so vast an amount of valuable information. We cannot agree with his statement, however, that coffee from which the caffeine has been removed may be used with impunity, nor with the additional statement that tobacco should not be used under any circumstances, although this is in the article which deals with estimation of failure of the heart. In an interesting note considering the frequency with which cardiac failure manifests itself during defecation is the statement that it has been shown that there is a rise of from 30 to 50 millimeters of mercury during the act of defecation. Not only is the drug treatment of the various conditions given with detail, but the diet is also well discussed, and sample diet lists are included. The only thing it seems to us which could be added to the book with advantage are more detailed descriptions as to the exact technique concerning the use of certain forms of apparatus which, so far as their shape and form is concerned, are well described. We expressed the thought that this book was a credit to American medicine when the first edition appeared, and the second edition is still more creditable.

FOODS: THEIR ORIGIN, COMPOSITION AND MANUFACTURE. By William Tibbles, M.D., LL.D., L.R.C.P., etc. Balliere, Tindall & Cox, London, England, 1912. Price 18/-. Agents in America, Chicago Medical Book Company.

At the present time when there is such an extraordinary interest in the subject of pure foods, pure drinks, and adulterations, this book will receive attention which a few years ago would have been denied it. It contains an immense amount of very valuable information. It is of help to physicians, to the laity, and even the housewife, although much of the information will prove somewhat "over the head" of the latter class of individuals. After giving the constituents of animal and vegetable foods, it describes in Part II what the author is pleased to call "The Materia Alimentaria" from the animal kingdom, in Part III the "Materia Alimentaria" from the vegetable kingdom. Part IV deals with condiments and spices, and Part V with beverages. As a rule the text is thoroughly up to date. As an illustration of the thoroughness with which the text deals with its subject, it is interesting to note that not only are deer and antelope mentioned as articles of food, but the reindeer, the elk, the camel, and the llama, as well as the badger, the raccoon, and the bear; even the hippopotamus and the rhinoceros are included, as well as all the animals which are more commonly taken as food throughout the world. Unlike many books which deal with subjects of this character, the author's statements are well balanced. He does not seem to be inclined to ride the subject of pure foods to excess. From what has been said it is evident that the text is not only useful but interesting; indeed, the volume may be described as a brief encyclopedia of all substances which are ingested by the human race.

A DICTIONARY OF TREATMENT, INCLUDING MEDICAL AND SURGICAL THERAPEUTICS. By Sir William Whitla, M.A., M.D., LL.D. Fifth Edition. Balliere, Tindall & Cox, London, 1912. Crown 8vo, pages 1204. Price 16/-. United States Agents, Chicago Medical Book Company.

Whitla's Dictionary of Treatment appeared twenty-two years ago next December, and at once took a position such as the reputation of its author would lead one to expect. The diseases are arranged alphabetically, beginning with Abortion and ending with Yellow Fever. Almost every disease which affects mankind is included, and this necessitates a rather brief consideration of some of them. Occasionally, the author puts in prescriptions illustrating the method which he would employ himself in treatment, and these formulæ add very distinctly to the value of the volume. Not only is the treatment mentioned under the name of the disease, but many symptoms of disease are considered alphabetically, such as bed-sores, dropsy, ascites. The volume is a handy one for the general practitioner. It is based, however, upon the British

Pharmacopœia, so that some caution will have to be used in prescribing some of the preparations of the more powerful drugs.

ORGANIC AND FUNCTIONAL NERVOUS DISEASES. A Text-book of Neurology. By M. Allen Starr, M.D., Ph.D., LL.D., Sc.D. Fourth Edition, Thoroughly Revised. Copiously Illustrated in Black and in Color. Lea & Febiger, Philadelphia, 1913.

There are few men who have contributed to American Neurology literature more valuable material in the shape of books dealing with this subject than the author of this volume. We welcomed the appearance of the first edition because it seemed to be the best single volume written by one author that American medicine had produced. In the preparation of the fourth edition Dr. Starr has brought to his task his increased experience and wide reading, and he has embodied in its pages the more recent advances in the anatomy, physiology, and pathology of the brain, spinal cord, and nerves. A very large number of the illustrations are original. The book is not one which the student can turn to to find in a few words the facts which will enable him to answer questions in a neurological examination. Its very thoroughness suits it for the library of the advanced student or the active practitioner. It covers nearly a thousand pages, but a considerable amount of this space is taken up with its very numerous illustrations. One point which makes the book of more than ordinary value to the general practitioner is the fact that the author covers with considerable detail the nervous symptoms which arise as complications or sequelæ of primary illnesses; thus, for example, multiple neuritis and tuberculosis, multiple neuritis and syphilis, multiple neuritis and diabetes, neuritis following gout and rheumatism, and that complicating cancer, and, finally, senile polyneuritis. The general practitioner probably meets these forms of nervous disease—that is, those complicating ordinary maladies—more frequently than he does the types which naturally pass under the charge of the neurological specialists early in their career.

ELECTROTHERAPEUTICS FOR PRACTITIONERS. By Francis Howard Humphris, M.D., F.R.C.P., L.R.C.P. Illustrated. Longmans, Green & Company, New York, 1913.

The question as to whether it is possible to discuss modern electrotherapeutics in 234 pages we think some of our electrotherapeutic friends will answer in the negative. As the author well says, "this is a specialty to which not too much space has been given." He does not pretend to present a text-book of electrotherapeutics; his idea has rather been to convey information as to some of the useful forms of electrotherapy and to indicate those diseases in which this branch of therapeutics is most generally useful. Furthermore, what he states is based upon personal experience from the results which he himself has obtained. The book is scarcely one which will be picked out as the best for the student who has no other volume dealing with this subject, but those who are practicing electrotherapeutics will find many points of interest in it.

THE PRACTICAL MEDICINE SERIES. Under the Editorial Charge of Gustavus P. Head, M.D., and Charles L. Mix, A.M., M.D. Volume X: Nervous and Mental Diseases, Edited by Hugh T. Patrick, M.D., and Peter Bassoe, M.D. Series of 1912. The Year-Book Publishers, Chicago. Price $1.35.

Drs. Patrick and Bassoe have provided an excellent summary of neurological literature during the latter part of 1911 and the early part of 1912, and as Dr. Patrick is without doubt the leading neurologist of the Western States he has sifted the subject with much skill, picking the wheat from the tares. The illustrations are excellent. One of the most interesting is that showing the spirochætæ pallida in the wall of a syphilitic brain artery.

MENDEL'S PRINCIPLES OF HEREDITY. By W. Bateson, M.A., F.R.S., V.M.H. G. P. Putnam's Sons, New York, 1913.

The object of this book is to give a succinct account of discoveries in regard to heredity made by the application of Mendel's method of research. The author thinks that in following the clue which Mendel's long-lost papers provided we have reached a point from which classes of

phenomena hitherto proverbial for their seeming irregularity can be recognized as part of a consistent whole, and thinks that the study of heredity has thus become an organized branch of physiological science already abundant in results and in promise unsurpassed. The author has brought his text up to November, 1912. As "Mendelism" is now one of the favorite lines upon which investigation is being carried out his book is assured of a warm welcome, particularly by those who are fond of dealing with this branch of science.

MEDICAL LABORATORY METHODS AND TESTS. By Herbert French, M.A., M.D., F.R.C.P. The Chicago Medical Book Company, Chicago, 1912. Price $1.50.

The third edition of this book first appeared in England, it is stated, in 1911. Its idea is to provide the general practitioner with a small volume which can be fitted, because of its flexible cover, into a sack-coat pocket as a brief handbook or manual. The author has succeeded most admirably in his task, and although the illustrations are small, so as not to take up too much space, no less than 88 are found scattered through the text, and practically all of them are good. The colored plates are also excellent. In the space of 174 pages the author considers the examination of the urine, the blood, the sputum, pus, gastric contents, and feces, as well as microscopic examinations in infections of the skin and of the various exudates and transudates, and also normal body fluids. The preservation and staining of morbid anatomy specimens, the examination of seminal stains, and last of all, in a few pages, tests for the commoner poisons are included. To the general worker who has not time nor opportunity to use a large laboratory manual this little book, which is inexpensive and accurate, can be cordially commended.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

The Departmental Committee appointed by the government to investigate the whole question of the treatment of tuberculosis in this country has just issued its final report. The commissioners were asked to advise on the general principles which should guide the authorities in their efforts to deal with this disease. Their chief recommendation is the establishment of an Advisory Council and Executive Committee which should include representatives of the present government departments concerned, of medical and scientific bodies engaged in research, together with distinguished scientists and business men. This Council and Executive Committee would practically form a new government department to deal with tuberculosis. The commissioners also recommend that tuberculous patients in a state of high infectivity should be compulsorily isolated, especially when the surroundings are such as to increase the risk of infection to other people. With regard to bovine infection they consider that the entire eradication of tuberculosis in cattle ought to be aimed at, though they recognize that this eradication must be a slow process. The drastic order from the Board of Agriculture mentioned in last month's letter is a step in this direction, and ought to produce good results if carried out in its entirety. In connection with this the commissioners recommend that the local authorities should have power to inspect the sources of milk supply, herds, dairies, farm buildings, etc., and that these new powers should include the whole country so as to secure uniformity of treatment. The provision of the sum of £200,000 for open-air schools for children is also recommended, not only for those who are actually tuberculous but also for the large number of children who are suffering from ailments which predispose them to tuberculosis if neglected. It is recommended that the Council

should employ competent investigators to carry out pathological and bacteriological researches at approved institutions. One of the chief reasons for recommending the establishment of a council of experts rather than a minister of health or government department was that the commissioners considered that the latter could not make the best possible use of the national insurance grant without obtaining the advice and assistance of many experts. We are glad to observe that the commissioners consider that additional facilities ought to be given to medical students and practitioners for perfecting themselves in the diagnosis of tubercle. As the tendency is to withdraw the tuberculous patients from the general hospital into sanatoria, the medical student of to-morrow will have little chance of studying tuberculosis unless special opportunities are given him.

The institution named the National Health Building, where the affairs of deposit contributors under the National Insurance Act are attended to, seems to be rather a misnomer in one way, for strong complaints have been made about the ventilation, or rather lack of ventilation, in that building. The few windows are permanently fastened and the ventilators appear to be inefficient. The heating apparatus is fixed at one end of the building, so that while the women clerks suffer from extreme heat, the men are frozen at the opposite end. We hope the health authorities will soon put their house in order.

Last week the King and Queen formally opened a vast new reservoir which has been constructed by the Metropolitan Water Board as a colossal storage place for the wants of London. The area of this reservoir is over 460 acres, and its capacity is some three thousand million gallons. It will form a lake with a maximum depth of 40 feet and a circumference of 4¼ miles. The water-supply is drawn from the River Lea by five huge pumps known as the Humphreys pumps. They are a new invention and are based on the principle of internal combustion, like a motor engine. Each one is capable of lifting 40,000 gallons of water per minute into the reservoir, so with all the pumps working at once the whole capacity could be filled in ten days. The provision of this new reservoir together with the existing places of storage should do away with all fear of a water famine in London.

We shall await with interest the verdict of American doctors on the work of Dr. Friedmann and his cure for consumption. We have not heard much about the details of the treatment, except that it consists of an injection of tubercle bacilli secured from turtles.

The Departmental Committee appointed to consider the question of playgrounds in schools has issued its report. The committee recognizes that education must include the healthy development of the body as well as instruction and moral training. The present regulations of the Building Committee of the Board of Education demand 30 square feet per head of accommodation. The committee thinks that this space should not be diminished in new schools unless other provision is made in parks or open spaces for organized games, etc. If such provision is made 20 square feet per child may be considered sufficient. These regulations apply to new schools to be built, but the problem is much more difficult with old schools. The committee recognizes that public opinion would not sanction the expense involved in bringing all playgrounds up to the regulation size, but they suggest that after 1920 any playground allowing less than 10 square feet, and after 1925 less than 15 square feet, per child, should be classed as "insufficient." The committee considered that there was no special danger attaching to roof playgrounds if they were properly constructed.

In the King's speech at the opening of Parliament mention was made of the bill for controlling the feeble-minded which last session was crowded out by want of time. The bill will probably be reintroduced, and in addition measures will be proposed to further restrict the employment of children in industrial work.

The Royal Society proposes to establish

a memorial to Lord Lister by organizing a fund for the advancement of surgery. If a Lister Prize is established it will be given as the reward of good work accomplished rather than as an encouragement to younger men for research work.

This week will see the centenary of the birth of David Livingstone, the great explorer and medical missionary. Born and educated in Scotland, he was the means of rousing the Universities of Oxford and Cambridge to organize the mission to Central Africa. Perhaps his greatest memorial is the district of Livingstonia in Central Africa, which was established after his death to act as a center of civilization and Christianity for the natives of the country. Now, thirty-six years after the great explorer's death, there are in Livingstonia over seven hundred schools and nearly fifty thousand scholars, and the extensive work carried out by the medical missionaries there has been of great service to tropical medicine. It is now proposed to endow and extend the Cottage Hospital at Blantyre, Livingstone's birthplace, as a fitting means of celebrating the centenary of his birth.

A return issued by the Board of Trade shows that the number of street accidents is increasing every year. In spite of this no further arrangements are being made to deal with them, and persons, badly injured, often have to be conveyed considerable distances in makeshift litters. It appears that fresh Parliamentary powers are necessary before an efficient service can be established, so that the present state of things is likely to continue at present, for Parliament is far too occupied with contentious business to pass such useful and necessary measures as these.

We regret to have to record the death of Surgeon-General Sir Colvin Colvin Smith. Entering the Indian Medical Service in 1851 he had considerable war service, and during the Indian mutiny was in the field for two years. After his retirement he was appointed Honorary Surgeon to Queen Victoria, an honor which was continued to him during the two succeeding reigns.

PARIS LETTER.

BY CHARLES G. JARVIS, M.D.

One of the first public acts of the new President of the French Republic was to visit one of the large Paris hospitals. Here, as elsewhere, his reception was of the warmest, and M. Poincaré's very complete inspection of the wards and operating theaters was characteristic of his thoroughness and businesslike methods. Unfortunately in the course of the visit the ubiquitous reporters with their cameras were painfully prominent, and their forward and callous attitude elicited a severe rebuke from the President. By the way, it is not generally known that M. Poincaré is the grandson of a pharmacist and the nephew of Professor Emile Poincaré, of the Faculty of Medicine of Nancy.

The medical profession is well represented in the list of New Year's honors that has just appeared. Professors Robin and Widal are promoted to a high rank in the Legion of Honor, and the title of "Chevalier" is awarded to Dr. Alexis Carrel, of the Rockefeller Institute, New York. This eminent scientist received almost at the same time another honor which he is sure to value very highly. On February 11 he was elected a corresponding member of the Paris Academy of Medicine. Thus is France recognizing and rewarding the work of her worthy son—who would probably have been kept in the background had he not emigrated to a more generous country, where he has found opportunities that were lacking in his native land.

French dentists, unlike their American brethren, do not rejoice in the title of "Doctor" unless they be doctors of medicine. It is a noticeable fact that quite a number of medical men have taken up dentistry as a specialty. Recent statistics show that out of the 5000 odd dentists in France nearly 800 are doctors of medicine, a proportion of 16 per cent. Now all these dental doctors appear to be doing remarkably well. They "draw" better than the simple graduates in dentistry. The consequence is

that the latter are smarting under a sense of injustice, and they are now bestirring themselves with a view to obtaining the creation of a new degree—that of doctor in dental surgery. They hope then to enjoy the same privileges as their medical colleagues, who would no longer have the monopoly of the title of "Doctor" with the advantages, pecuniary and otherwise, that the title implies. The movement naturally meets with violent opposition at the hands of the medical men. The Paris Medical Syndicate at its last meeting carried a motion asking the government to set its face against any proposal to establish a new title of Doctor. It is agreed that if this much-coveted title is opened to dentists, there will be no reason for refusing the same advantage to midwives, masseurs, chiropodists, etc.

Meanwhile the question has been raised in the law-courts whether it is permissible for dentists to give chloroform or ether to their patients for the purpose of inducing general anesthesia. The law is silent on this particular point. Hence the interest attached to the judge's decision in a case where two dentists were prosecuted for giving chloroform. The verdict, however, was in their favor. This newly recognized right is a victory for the dentists, but the medical profession look upon it as a downright infringement of their own rights and privileges.

There is on the whole at the present time a regrettable state of tension between the two professions, and the more radical among the doctors suggest that the only way out of the difficulty is to decree that henceforth license to practice dentistry will be granted only to those holding the diploma of M.D. One of the first consequences of the proposed law would be to diminish the number of dentists, which is getting to be overwhelmingly large, so much so that a great many of them barely contrive to make both ends meet!

Three years ago some music-loving doctors in Paris decided to form a "medical orchestra," and to give concerts with the assistance of wives and daughters of medical men. The undertaking met with great success. The latest concert, which took place on February 13, was of a very high musical standard indeed and drew a crowded house. Another interesting association is the Medical Club that has just been founded in Nice. The object of this club is not only to bring together the medical practitioners of the Riviera, but also to offer a temporary home and a meeting-place to foreign medical men visiting Nice and district. The club-house is admirably adapted to its purpose. It is a large and modern building, with meeting rooms, smoking rooms, a large library, and a department for physical exercises and hydropathy. American doctors who care to visit the club are sure to meet with a warm welcome.

The French Senate has recently been considering that ever-important subject, criminal abortion. The danger is a very real one, not only from the standpoint of the woman's health but also by reason of the ever-diminishing birth-rate in France. No very practical suggestion appears to have arisen from the Senators' deliberations. Some of them, with M. Paul Strauss, would appeal to the conscience of doctors and midwives and would like the public to be better instructed in the risks of criminal abortion. Closer watch should also be exercised over the maternity homes, where so many illicit operations are performed, despite the heavy penal risks incurred in case of detection. Other Senators expressed grave doubts about the effectiveness of legislation in this matter. Besides, criminal abortion was but one small etiological factor among the many and far-reaching causes of depopulation in France. The only remedy was to be sought in the moral education of young people. In the course of the debate Senator Reymond, who is a surgeon of eminence, remarked that in his practice he had more cases of abortion than of confinement. He quoted the case of a woman who admitted having undergone abortion three times in ten months! And this is by no means an exceptional case in the lower middle class. Hence the large number of gynecological cases to be met with in the surgical wards of the hospitals here.